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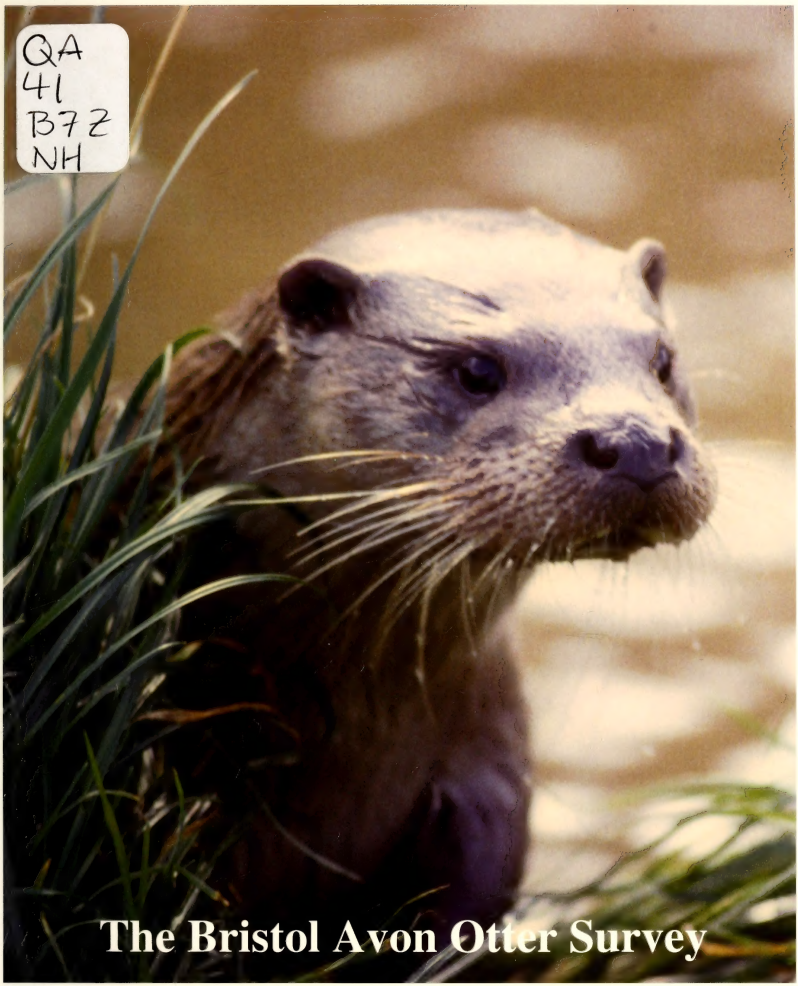

Nature in Avon

2002 Volume 62

Bristol Naturalists' Society

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Besides many general indoor and outdoor meetings and excursions, others are specially devoted to geology, plants, birds, mammals and invertebrates. Members may use the Society's large library. Many past Proceedings issues can be bought; details are available from the Honorary Librarian, Bristol Naturalists' Society, at the above address.

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NATURE IN AVON

THE PROCEEDINGS OF THE BRISTOL NATURALISTS' SOCIETY
Founded in 1862
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VOLUME 62 (for 2002)

EDITED BY PETER BELCHER

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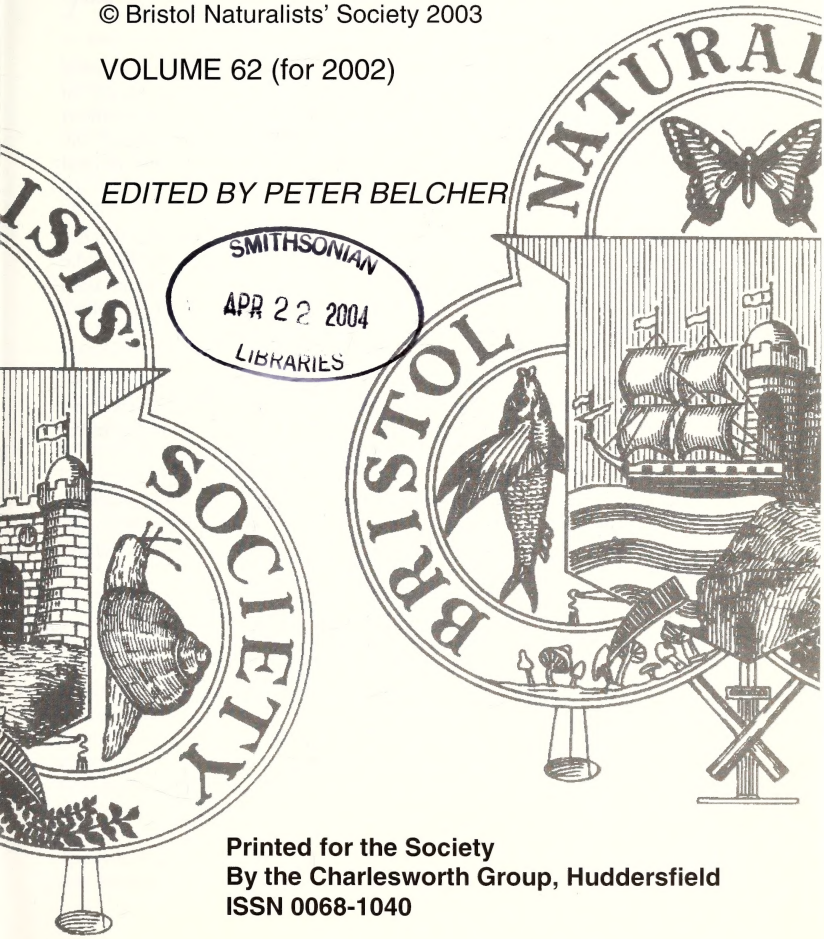

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EDITORIAL

It was with more than a little trepidation that I took on the task of succeeding Dr Terry Smith as Editor of *Nature in Avon*. In the previous two issues he has set new standards in both content and presentation and I have strived to maintain these standards.

Terry has been of immense help to me in preparing this edition and I am most grateful to both him and Richard Bland for their expertise and advice on editorial matters. I must also thank the other members of the Publications Committee for their guidance, and Mike Gaunt of Charlesworth Group, the printers, who has given freely of his knowledge in order to prepare this material for publication.

There would be no *Nature in Avon* were it not for the authors of articles, compilers of Biota and the members of Council and Sections who keep the records of the Society's activities throughout the year. These contributors keep the *'Proceedings'* what they have always been, a highly respected journal with a long and distinguished history.

In furtherance of the committee's endeavours to make *Nature in Avon* an attractive and readable journal, we are once more seeking shorter contributions, together with more substantial articles, and we hope that these will still reflect the regional interests of our members.

Whilst welcoming contributions, we would urge members wishing to submit articles that they should read the *Instructions for Authors* reproduced on the inside back cover of the Journal. Adherence to these instructions makes the life of the Editor very much easier.

Once again, the Editor must accept responsibility for any typographical errors that may have been reproduced in this issue, and for these he sincerely apologises.

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Proceedings of the Bristol Naturalists' Society (2002) 62:3-7

Rerum Cognoscere Causas

Fulfilling a vision.

R. L. Bland

An 140th birthday is a good time to take stock. What is the BNS for? And how should it relate to the various other local organisations, some of whom have articles in this journal? A good way of finding an answer is to look back to our foundation 140 years ago. On May 8th 1862, Adolph Leipner, newly appointed to teach Natural Philosophy (called science today) at Clifton College, summoned a meeting of like-minded men in Clifton and created the Bristol Naturalists' Society. At its first meeting its purpose was stated to be "to undertake every kind of science that finds culture amongst us" and "to combine the efforts of many observers, and unite in one body all who are willing to work". He became the first Secretary of the Society, a post he held for the next thirty years. He was to become primarily a botanist, but his scientific interests were very wide, and his vision was to guide the society until his death in 1894, and remains in force to this day.

In the first two years the Society established its rules and membership, and held a variety of meetings on diverse subjects. Then in April 1864 Adolph Leipner suggested, as an immediate objective for the society, creating a complete Natural History of the region, to include the geology, botany and zoology, and all wholeheartedly supported this. There must have been much discussion about how this was to be achieved. The result was that sections were created covering entomology, botany, geology, chemistry and zoology. Each had its own president, and each would be dedicated to its section of natural history. It was decided to cover an area of nine miles from the centre of Bristol, with Clevedon and Weston-super-Mare covered in an appendix, and to produce an octavo volume. As E.H. Swete in his Flora Bristoliensis of 1854 had already described the botany of the region, the botanical section began work at once on creating a herbarium for the museum, to act as a reference collection for all.

Meanwhile William Saunders, the first President, had published in 1864 his geological map of the Bristol Coalfield, defining in great detail exactly where on the ground each successive rock strata could be found, and it became apparent to all that the area defined by this study was the appropriate one to cover. It ran from Berkeley in the North to Wells in the South and was larger than the later county of Avon. It must also have become apparent that the enterprise was a very large one, and that the Proceedings were probably the best place in which the results could be published.

The first Proceedings article that could be considered part of the great enterprise was perhaps G.F. Burder's 1872 article on the rainfall in Clifton since 1850.

Then in 1874 began a series of articles, which were to set the scene for the next twenty years. First W.W. Stoddart published an outline article on the geology of the Bristol Coalfield, which was to be the first of a long series by a variety of authors detailing the complex geology of the region. In the same volume he had an article on the geological distribution of Bristol Mosses, showing how the moss species reflected the underlying geology. A. Leipner produced an article on land and freshwater molluscs of the Bristol region, making it clear that he was not simply a botanist.

In 1875 for the first time the coat of arms of the society featured in the introduction to the Proceedings, with the Society motto. This was the nineteenth century equivalent of the vision statement of today, and had the great merit of being very concise. "Rerum cognoscere causas", meaning, "to understand the whole natural world", a quote from Vergil, set the Society a target that, if a little ambitious, could at least be realised in some way within the immediate locality.

In 1875 E. Wheeler produced the Birds of the Bristol District identifying 168 species. In 1876 Cedric Bucknall published the first of 13 papers on the fungi of the region. His list of fungi ran to 1431 species, 100 of them new to Britain and was completed in 1890. It is striking that there were more species of fungi known than of plants.

Also in 1876 A.E. Hudd listed the first paper on the Lepidoptera, noting in the introduction that this was part of Leipner's grand endeavour. The insects were successively published, being completed in 1883. 1310 species were recorded, which were compared with 1246 in Norfolk and 1341 in Yorkshire, the only other counties to have published complete lists. He was later to list 1300 species for the Victoria County History of Somerset, which appeared in 1903.

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In 1879 the botanists decided to prepare a new flora as it was nearly thirty years since the last, and in 1881 the first paper on the 'Botany of the Bristol Coalfield' by J.W. White appeared. It is astonishing that it should be produced so rapidly, but A. Leipner was by now Professor of Botany at the University, and the ten years of work on the herbarium must have provided much of the data. The last part of this work was published in 1885. J.W. White went on to publish regular supplements, and this culminated in 'The Flora of Bristol' published as a separate work in 1912. This is widely regarded as a classic of its type. From 1913 he produced an annual report on new botanical discoveries, which continues in the same form to this day, and is the basis of the biota section of the present Proceedings.

In 1883 a short series of full weather records began to be published by H.B. Jupp, to complement Burder's rainfall records. This was later to be taken over

by Rintoul, and his Clifton College records to 1916 were the official records for the Meteorological Office. In 1920 the records from the Long Ashton Research Station became the standard, as they are to this day, though, as it is shortly to close, this will cease.

A. Leipner died in 1894, and his obituary does not mention the great project. In 1898 the British Association for the advancement of science met in Bristol and its handbook, which I have been unable to find, gave a complete account in brief in one volume of the natural history of the area, based on the work that had been done so far. In one sense this was what Leipner had originally hoped for. But the efforts he had inspired in them proved to be a further inspiration. In 1897, for instance, an Ornithological Section was created specifically to update Wheeler's 1975 list, and in 1901 a new list of 197 species was published, and the section dissolved. In 1922 it was resuscitated under the leadership of Coldstream Tuckett, and has flourished ever since.

But there was much more to do. There were new geological discoveries such as the Tortworth inlier identified in 1907, an area of exceptionally ancient rocks exposed at the surface. In the same year H.C. Charbonnier published the Mammals of the Bristol District, finding 37 species, and E.E. Fritsch recorded 'The Algae of Abbots Pool'. In 1912 Arthur Vaughan published a magisterial article on the Avonian series of Carboniferous Limestone in the Avon Gorge, with very fine photographs of both sides of the Gorge. In the same year H.C. Charbonnier published a list of the Diptera of the district and in 1913 there was an article on the distribution of Mycetozoa, a branch of the fungi. In 1915 appeared an account of the natural history of Steep Holm by a series of authors, the first detailed study of a specific area.

The post war world years saw a number of developments. Firstly, the concept of an annual biota, with notes on Botany, joined in 1936 by notes on Birds, which was to become, in due course, the Avon Bird Report, and from 1949 a report on Lepidoptera. At first these concentrated on rarities, but increasingly have sought to monitor the process of change.

Secondly there were increasing numbers of studies of specific sites. These began with an article in 1928 by Stuart Thompson on the Berrow Flats, in 1929 one on the Avon banks, and in 1932 a study of Denny island by Harrison Matthews. In 1933 A.C. Leach looked at the birds of Barrow Gurney reservoirs, and Averil Morley in 1934 the bird-life of Clifton Down. The heath association of Black Down in 1937 and the ecology of Dundry Hill by Gertrude Bailey in 1939 were other notable studies.

Thirdly a series of studies of marine life began. The first was a note on sea

fisheries by Harrison Matthews in 1933. Then came two articles on the coast of Somerset by O. D. Kendall in 1936 and 1939. In 1937 the first of 19 articles on the biology of the Bristol Channel was published. This was part of an intensive study by the Bristol University Biology Department, some of it published by the BNS, which lasted until 1956.

Fourthly there were continuing updates on previous studies of the Bristol area. H. Audcent published regular lists of the Diptera between 1928 and 1934, listing 1750 species. H. Tetley published a study of the land mammals in 1940 as a result of the change since Charbonniers article in 1907, which noted the first sightings of Grey Squirrels in the area, and Harrison Matthews published a note on marine mammals. Sandwith was working on the alien flora of the docks in particular, and published a study in 1932. In 1947 H.H. Davis published an updated version of the bird list with 276 species.

In all this development Leipner's vision was not forgotten. J.W. Tutch mentioned it in an historical sketch of the society in 1932 and it was repeated in the Centenary History produced in 1962. The vision of a single work encompassing the whole was almost achieved in 1955 when 'Bristol and its Adjoining Counties' was published for the meeting in that year of the British Association for the Advancement of Science. There were detailed articles on geology, physiography, climate, fauna and vegetation. Most were written by members of the university, but the Proceedings of the Society feature large in the references.

This was in some ways a highpoint. There existed an extraordinarily complete knowledge of the geology, plants, birds, fishes, insects, fungi and marine organisms of the area defined by William Sanders map of 1864, the greater part of it printed within the Proceedings.

Since then our understanding has become in many ways far more complete. The changes have been complex. Firstly the focus has switched. Bristol observers now see themselves as part of a national network, creating national understanding. The formation of the British Trust for Ornithology and the Botanical Society of the British Isles encouraged participation in national surveys from the 1930s. These have become increasingly the focus of society activity, whereby we harness local knowledge and enthusiasms to national aims. The advent of computers has made this ever more effective. The notion of uniting the efforts of many observers noted in 1862 has been realised a wholly new way.

Secondly the recognition that the natural world is not static, but in a process of perpetual flux, driven in part by natural processes of competition and variation,

in part by the environmental stresses created by man. Hence the desire to map distribution by atlases, and to monitor populations by ever more sophisticated techniques. This began in the plant world and spread to the birds. It was to lead to the establishment of the Bristol Environmental Records Centre, part of a national network of information.

Thirdly there developed an increasing awareness of the fragility of the environment itself, and the danger of local extinctions. This was already clear to J.W. White in 1912, and to ornithologists in the 1930s, but as we learnt to measure population change we have become aware of the scale both of gains and losses in many species. This led to the demand for conservation, and the establishment of the Avon Wildlife Trust.

It led also to a recognition by central and local government of the necessity of creating a society that was in the long term sustainable. The word is on everyone's lips, but its real meaning, that we must live in complete harmony with the natural world, taking from it no more than we back put in, is very far from any sort of realisation.

Fourthly these changes made the study of natural history an increasingly professional activity. The world of the amateur naturalist, represented with such brilliance by the BNS, even though its founder and many of its early members were also Professors of Botany or Geology, appears to be irrelevant.

But, finally and most significantly, there also came a recognisation that everyone could and must be involved both in understanding and in protecting the natural world. Everyone could participate in citizen science, and be involved in their own locality. Thus there came into being new local societies and nature reserves, an enthusiasm for doing something that in some way would show that we did care and were involved.

Adolph Leipner's vision of bringing together the observations of all in order to create a complete understanding of the natural world that supports our civilisation is as valid and necessary today as it ever was. The need to ensure that those who take the key decisions are guided by precise and sound knowledge of the probable impact of their actions has never been greater, and the need to educate every citizen in a democratic society is vital. The Bristol Naturalists' Society has played an outstanding role in this process in the past 140 years, and will continue to do so.

Richard Bland

Proceedings of the Bristol Naturalists' Society (2002) 62:8-11

Reflections

Mary Taylor

Our President in 2002, Mrs Ann Wookey, suggested that, as my membership spans more than fifty-five years, it might be interesting to write some notes on changes in the Society during that time. What follows is the result. A few members are mentioned by name: more information about some of them is given in my husband's paper '100 years of Ornithology in the BNS', in our proceedings for1999.

My parents joined the BNS in the mid-1940's, having been duly proposed for membership by an existing member, as was then necessary. A basic subscription was paid, plus an additional sum (half a crown, or 12.5p) for each section joined. I was accepted as a Junior Member soon afterwards. The first time I attended a meeting alone it was with great anxiety that I found my way to the University Quadrangle and up the steps to the Wiglesworth Library. A gentleman in bowler hat and dark overcoat assured me in a deep, booming voice that this was indeed the venue of the lecture to be given by Howard Davis, long time Secretary of the Ornithological Section, on 'The Art of Archibald Thorburn'. The many sketches and signed artist's proofs, some now in our possession, were indeed the treat of a lifetime. Thorburn was one of the foremost bird illustrators of the time, contributing many plates to the famous *Handbook of British Birds.*

It was the great character and falconer Harry Savory who had been my guide. He it was who gave another memorable lecture, on hawks and hawking, at which he showed some beautiful hoods and jesses from the Dutch House of Orange. Another well remembered talk was on the effects of fluorine in drinking water in preventing tooth decay, but in excess causing fluorosis. This was long before fluorine was deliberately added to our mains water.

In my earlier years most meetings were held in University lecture theatres and attended by numbers of academics and by teachers from public schools. Business took time. Minutes of the previous meeting, including a summary of the lecture, were read and confirmed. Any recent observations by members were noted. Then followed a formal introduction of the speaker, together with details of his (seldom her) work and achievements. In those days a lecture with no form of visual aid was the norm, and many were given by members. The use of an epidiascope required an assistant to manipulate the books and engravings; likewise for the slide lantern, to handle the heavy boxes of 3-inch glass slides. After questions came a fulsome vote of thanks. Reminders of forthcoming meetings followed and then folk crowded round the lecture bench to chat or examine books, pictures or specimens on display. Due to post-war shortages

there were very few new books, and paper was of poor quality, with only a few black and white illustrations. Skilled photographers like J.H. Savory and R.P. Gait would bring prints taken with their cumbersome half-plate cameras. It was a time when specimens were still 'obtained' and on one never to be forgotten occasion a reverend gentleman, having visited Brean Sands after a severe storm, displayed a box full or heads from various seabirds that he had found dead on the beach, decapitated. Over the years visual aids came to be usual – First, black and white slides, followed by colour slides, then colour films, and, most recently, Power Point presentations.

One great memory was of my first annual dinner, a very formal affair held at Bristol's Grand Hotel. I was the youngest present, among all those important people! Food rationing was still in force, but it was the sense of occasion plus the guest speaker's talk that mattered – Field-Marshal Lord Alanbrooke, Chief of the Imperial General Staff, came to show his films of Sparrowhawks nesting on his estate. The Society has seen many changes in this feast, from the formality of the hotels and then the University's Senior Common Room, through a delightful summer cheese and wine party in Goldney Garden, then the D.I.Y. efforts of a few years ago, to the splendid celebrations of two recent years, when we returned to our roots at the Masonic Hall at the foot of Park Street.

The gift of lecturing was not possessed by all; on one occasion, we suffered an hour's reading of closely written notes without once raising either eyes or voice – I don't remember the subject. This contrasts with an occasion when Brian Vesey-Fitzgerald, well-known naturalist and broadcaster, chatted for a similar time while relaxing back against the laboratory bench, and kept us enthralled. From that occasion the expression 'chime of dandy dogs', for a group of hunting weasels, passed into our family vocabulary. Another notable occasion was a lecture on gulls by Professor Niko Tinbergen, the famous ecologist. I missed this talk, being in hospital awaiting the birth of my first child, but he kindly autographed my copy of his New Naturalist volume, *'The Herring Gull's World'*, and on hearing the reason for my absence, he ornamented its title page with a sketch of two gulls giving the 'long call'

The Society's links with the University have weakened with changes in its organisation. Once, the Professors of Botany, Zoology and Geology were lords of their departments, and – all being BNS members – gave permission for meetings to be held in their lecture rooms. Now the University is run as a business, and hire of rooms has become so costly that we have had to move elsewhere; while lecturers are so busy that few have time to devote to local societies.

Presidents of the Society used to alternate between professionals, often academics from the university, and amateurs from other backgrounds. Sir Lewis Fermor, who was President when I was first a member, seemed to me to be rather distant and aloof – having retired from the Geological Survey of India as an eminent man famed for discovering important manganese deposits, he was held in some awe.

Communication with members was by means of the monthly foolscap Pink Sheet. This eventually became the 'Yellow Peril', which grew into the Bulletin we have today, though the number of pages has grown along with the breadth and interest of its contents.

A constant companion on country walks was *A Flower Book for the Pocket*, by Macgregor Skene, Professor of Botany in the University, who sometimes lectured to the Botanical Section on difficult groups, like the grasses. Field trips by coach were very popular; giving access to places that could not be reached by public transport (few members owned cars). We all reacted with pleasure when the words 'a cream tea will be taken' ended the details on the Pink Sheet of a forthcoming trip to Exmoor – a real luxury, as food rationing continued into the 1950s. On ornithological outings a great deal depended on the leader's knowledge of the area, skill in identification and ability to impart this to others. It is easy to forget that in the early post-war days very few had the luxury of field glasses, and fewer still owned prismatic binoculars. There was a degree of mutual help along members, who shared their glasses and tips on recognition. I had only a small second-hand telescope and later a superior ex-naval 'scope with variable magnification. No tripods – a ledge, rock, knee or borrowed shoulder had to suffice. Pocket field-guides were almost non-existent: my *Observer's Book of Birds* with only alternate colour plates was my only aid at first. Later a copy of *Birds of the Wayside and Woodland* abridged by Enid Blyton from the three-volume work by T.A. Coward, was my essential companion. In those days I was a frequent visitor to the bird collections in the City Museum to gain knowledge of comparative sizes and colours of similar and related species. It was 1954 when the first coloured guide specifically for the field identification of birds appeared.

Of outdoor meetings, a geological field trip in 1948/9 led by Prof.Whittard was without doubt the most prophetic. We walked along the beach at Aust and were shown the area where the strata and underlying geological formation would be suitable for the siting of a bridge across the River Severn. I certainly never thought this would become a reality, even less that in my lifetime there would be a second bridge! The little car ferry seemed quite adequate then, though if it was closed due to bad weather a long cycle ride round Gloucester was needed

(as happened to me one Easter, when the weather also caused both the Oxford and Cambridge boats to sink during the Boat Race).

A number of BNS members have greatly enriched my life through their humour, knowledge and erudition. Amongst those no longer with us I must mention George Sweet with his great knowledge of the New Forest and its rarer raptors; G.A. Forrest who would enliven coach trip with comments like 'I defended a man from there against a murder charge'; H.R. ('Steve') Hammacott; H.W. Neal, with his uncanny instinct for nest-finding and a fund of stories from pre-war years; and last, but not least, G.E. Clothier, who fostered my early interest in birds and sustained it with his practical guidance and enthusiasm (he once described me as "a small girl with a very long telescope'.

One aspect of the Society has always been the amount of time put in by officers and members, but over the years a far more active role has become necessary for those holding elected positions, demanding a much heavier commitment in a far busier world. Changes in the legal obligations of the society, its charitable status and the need for health and safety compliance, have had major effects on its management. In the past it was hard to be elected to a committee or similar post, but now it is sometimes difficult to find a volunteer.

Little did I know what an impact the BNS was to have on my life and on my marriage. From the moment my husband succeeded me on the committee of the Ornithological Section in the mid-1950's, he seems to have been involved in almost every part of the Society. There have been times when I have felt like citing the BNS as grounds for divorce; the worlds 'Proceedings' and 'Bird Report' often struck dread into the household, knowing that holidays and outings would take second place. This is my opportunity to tell of the hours, nights and early mornings when the typewriter would be in full cry, and of the effort and patience needed to make lines fit – there was no automatic justification then; the words 'cut and paste' meant just that. In the days before word processors scissors and paste were used to change single words, or lines of type were literally rearranged to fit the page or the final number of pages. Five a.m. was the record early morning finish. The relief when a manuscript went at last to the printers was tremendous. I do realise that producing a well-written article or paper is a matter of great personal pride and satisfaction to my husband. We celebrated our golden wedding in 2002, so my earlier thoughts did not come to fruition.

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Proceedings of the Bristol Naturalists' Society (2002) 62:12-23

The Natural History of Ten Acres

Faith and Tony Moulin

Yatton and Congresbury Wildlife Action Group (YACWAG) evolved over a period of several years as the interests of a group of local wildlife enthusiasts developed and crystallised. Many of YACWAG's committee members were originally part of a local group of the Avon Wildlife Trust, or involved with the Yeo Valley Watch Group, but in the spirit of Local Agenda 21, began to think and act more locally. Under the previous banner of 'Friends of Biddle Street SSSI', the group had, since 1995, been managing a 2.3 km section of the disused railway, the Cheddar Valley Railway Local Nature Reserve, on behalf of North Somerset Council with help from English Nature, but in 1999 new legislation obliged charity registration. To reflect a wider interest a name change was required, and so YACWAG was born, with Tony Moulin as Chairperson.

We felt that the freedom to experiment with nature conservation methods, and the continuity of our actions, could only be achieved by ownership of land. This opportunity arose almost immediately when a number of fields on Congresbury Moor came onto the market. Mark Britten, a local farmer with a great interest in wildlife, bought some of them that were adjacent to his own land, and told us that a particular field might suit our purposes. The field was just over ten acres in size (4.089 hectares) and immediately became known, with little originality, as 'Ten Acres'. It became our ambition to purchase it and turn it into a nature reserve.

The new experience of raising large sums of money was both exhilarating and anxiety provoking, with many twists and turns. As the field is within the Biddle Street SSSI and is floodplain grazing marsh, a habitat covered by a national Biodiversity Action Plan as well as a local one, we approached the Heritage Lottery Fund. To our delight they were able to provide almost £20,000, which was 75% of the project costs. Other contributions came from Yanley and North Somerset Environmental Company (YANSEC) from the landfill tax rebate scheme, and by Wessex Water, who gave us £2,500 as their very first 'Gold Award' project.

A brief history

Ten Acres appears on the 1840 tithe map as two enclosures separated by a ditch. This ditch is clearly visible on the RAF aerial photograph of 1946 but more recently it had disappeared, although it retained some hawthorns on the eastern bank. This ditch was now home to old beds, domestic and farm machinery, dead animals, copious amounts of black plastic and manure. One of our first tasks was to remove this and have the ditch reinstated. We added a berm on one side for added wildlife value, and the spoil from this operation created a north-south bund providing other opportunities for wildlife.

In one corner of the field we had noticed a stone platform. A survey by a field archaeologist revealed that a bridge on this spot had formed an access to the Great, or North, Moor of Congresbury. This bridge is shown on a 1736 survey of lands in Congresbury belonging to Queen Elizabeth's Hospital of Bristol. The moor in the eighteenth century appeared as an open common, bounded to the south by the Congresbury Yeo, to the east by lands known as Cow Leaze and the Hurst, to the north by the irregular Hurst Pool Rhyne and to the west by an ancient trackway called Waterlands Way and an early enclosure known as New Croft (Broomhead, 1999). New Croft is now also owned by YACWAG.

A moor is often thought of as an upland area with heather growing on it. The true definition does not require it to be a high place, and the moors of North Somerset are inland areas, while the term 'levels' generally refers to coastal areas underlain by alluvial clay. In the past, moors were regarded as 'waste ground' of little value, yet this land had been productive for centuries, providing local people with fish, eels, wildfowl and summer grazing, as well as reed for thatch and rushes for floor covering and lights (Storer, 1972). Although some drainage took place before the Enclosure Acts the land must always have been wet in winter. There were no houses here and few tracks across it. The routes from Yatton to Congresbury or from Yatton to Hewish lay on higher ground to the east, or were protected from flood by the ancient sea defence known as Gang Wall (Campbell, 1997). The earliest documentation is medieval with references to the driving of cattle onto the moor. A survey of 1567 mentions the 'North More' of Congresbury (Broomhead, 1999).

Big Changes

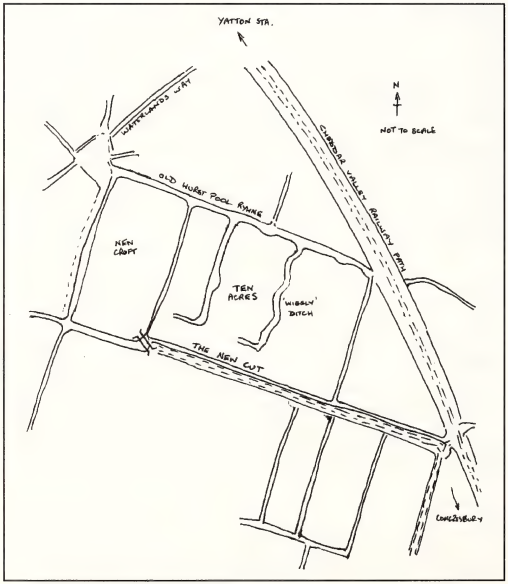
The North or Great Moor was enclosed by an Act of Parliament in about 1813 and became known as the 'New Moor' on the Enclosure maps. Why was it known as the 'New Moor' if it had 'always' been a common area for the use of Congresbury villagers? Local areas acquired with the enclosures new names – Kenn Moor, Nailsea Moor, Tickenham Moor and … Congresbury Moor (Beisly, 1996). It is to be supposed that with the extensive improvements to flood defences and drainage, this area now useful to the new agricultural system was in that sense a 'new' moor.

There were very great changes to the landscape at the time of the Enclosure Acts and Congresbury Moor suffered the same agricultural improvements as the rest of the country. A large pond or lake disappeared from the maps and a new drain was put in. John Rennie, later Sir John Rennie, the Victorian engineer of renown, engineered the local drainage system, which was finished in 1827. His complicated solution to the problem of how to prevent the tidal water of the Congresbury Yeo from inundating the Moor involved a rhyne being culverted underneath the river to join another new rhyne (Hildich, 2001). The work was extremely successful and the system remains effective today. Another great Victorian engineer, Isambard Kingdom Brunel, was responsible for further

changes in the landscape when the Cheddar Valley Railway, a Broad Gauge branch of the Great Western Railway, sliced through the north east corner of the moor on an embankment in 1867-9.

New Cut

When the area that includes Ten Acres was divided up into fields by the excavation of rhynes forming 'wet fences', Rennie's New Cut was dug on the southern boundary of the field. It must have been a huge upheaval for wildlife at this time with the destruction of marsh habitat in favour of creating land suitable for cattle grazing. Ten Acres was probably not ploughed and re-seeded but the improved drainage affected the flora and, within decades, confined the wetland species to the edges of the rhynes and ditches.



The New Cut is now managed by the West Mendip Internal Drainage Board (IDB), being a very important part of the flood defences for homes in Congresbury. It is dredged and keeched (weed cleared) often and the vegetation cut from the banks twice a year. There are few niches for wildlife with this kind of management, and most of the wetland flora has disappeared to be replaced soon by nettles. Shortly after YACWAG bought Ten Acres we were delighted to see a large number of Small Tortoiseshell (*Aglais urticae*) caterpillars feeding on nettles at the top of the bank to the New Cut. Within a week or so these were totally destroyed when the bank was cut by the IDB. Traditionally the IDBs have had almost absolute powers to maintain drainage in any way their Board sees fit. After much lobbying of Parliament some modernisation is now in place and it is recognised

that the IDBs have an important role in conserving biodiversity. As landowners we are required to pay an annual rate to the IDB for their work, and we were now able to request them to reduce the cutting of the banks of New Cut in accordance with their own best practice guide and their duty to nature conservation imposed by central government under the Land Drainage Act 1994.

There is a potentially happy ending as a partnership project was undertaken early in 2003 to improve New Cut. This pilot project will reduce the need for intensive maintenance and prevent the banks of Rennie's Rhyne from slumping. Most landowners are reluctant to lose any of their land for IDB improvements, but YACWAG has allowed the edge of the field to be taken because of the gains for nature conservation. 150 metres of the ditch has been re-profiled with berms and varied bank gradients to provide a diversity of niches for emergent plants. It is hoped that this will also suit the Water Vole (*Arvicola terrestris*), which is one of only eleven priority species of terrestrial mammals to be identified in the Biodiversity Steering Group Report in 1995 as needing conservation action. A Species Action Plan was published in 1997. YACWAG's bank should not 'need' cutting frequently because of the increased capacity of the rhyne, and we envisage cutting in strips every other year as recommended in the Water Vole Conservation Handbook (Strachan, 1998).

A watching brief

YACWAG's priority was to see what happened with minimum intervention. By the time we acquired Ten Acres it had been receiving annual applications of fertiliser "to beef up the grass". We favoured a low-intensive approach and decided simply to let the grass grow! First of all it was important to establish what was already on the site. Amateur enthusiasts were soon grappling with keys and accompanying those with more knowledge into the field. We never refused an opportunity to walk down to the field with professional ecologists and learn from them. Thus we were able to identify many grasses and sedges, and were rewarded by a good diversity to practise on. The fertiliser had not done as much damage as might have been feared, and the invertebrates seemed surprisingly numerous too.

In our first summer we stood on the Cheddar Valley Railway path and enjoyed a sense of pride in seeing a Kestrel (*Falco tinnunculus*) hovering over our field. It was the middle of July and Ten Acres was the only field on the moor with long grass. The grass was full of Field Voles (*Microtus agrestis*). It set the scene for YACWAG's future management actions on Congresbury Moor. We would try to provide habitat, which, because of current agricultural practice, no longer existed.

Just add water

English Nature had designated Biddle Street a SSSI in 1994 because of the aquatic species present in the rhynes and ditches. An agreement was reached to put the field under the Wildlife Enhancement Scheme (WES), and English Nature enthusiastically encouraged us to accommodate more water.

One of our first actions was to create more wetland features. As well as restoring the straight ditch previously mentioned, including the creation of a semi-circular shallow pool half way along it, we also opened up some field gutters, smashing clay drainage pipes in the process and creating small (half a metre wide) ditches that hold water in the winter. These field gutters are known in Somerset as 'grips' (pronounced gripes) and produce an undulating appearance in fields. This additional water storage area also helps to maintain the dampness of the field. In the second year Ragged Robin (*Lychnis flos-cuculi*) was flanking some of these field gutters. We also decided to create a new ditch that would divide the remaining area in half, creating three compartments within the field. These could then be treated differently and provide comparisons for management techniques or regimes. This new linear pond can truly be called the glory of Ten Acres.

The Wiggly Ditch

The Wiggly Ditch, as it has become known, was constructed with the help of Andy Pearce of Pearce Waterscapes and the encouragement of Stephen Parker of English Nature, and was funded by WES capital payments. Incorporating some bends in the design provided areas with different aspects to catch the sun or provide shelter from the wind. It also gave corners for shy creatures to hide in. Beside our new super-ditch the huge bunds of extracted clay have provided a useful niche for small mammals when the ground is wet, as well as a range of colonising plants. From the field gate it is impossible to see the larger creatures using the waterside, but the many slots of Roe Deer (*Capreolus capreolus*) show that it is a regular track for them. A stroll along the edge of the Wiggly Ditch will often flush out Snipe (*Gallinago gallinago*), Mallard (*Anas platrhynchos*) or Green sandpiper (*Tringa ochropus*). On 8th November 2002 Trevor Riddle, a trustee of YACWAG who monitors the birds on our patch, flushed a record 21 Snipe from the ditch edge.

The ditch has a deep central channel designed to provide deep water at all times and resist colonisation by emergent plants. A berm was constructed on both sides to provide shallow water habitats where birds and mammals can drink and where the water is warmer for invertebrates. The banks slope gently and thus

provide optimum wildlife habitat. While local rhynes and ditches do provide some good habitat, the narrow strip at the side of a ditch is often too restricted to be useful to wildlife. In an intensively grazed field the traditional steep sided drainage rhynes provide little cover from predators and a very restricted range of opportunities for both plants and animals. Our Wiggly Ditch provides a variety of food, cover and shelter.

A plug of clay was inserted at the open end of the ditch close to the Hurst Pool Rhyne. This reduces the fluctuations in water levels that occur elsewhere on the moor. Footprints show that this is also a handy crossing point for the local foxes and deer.

Colonisation

In the first year the plants that appeared in the open water of the Wiggly Ditch were alarmingly unattractive algae but the edges soon also greened up with abundant creeping Brooklime (*Veronica beccabunga*), Common Spike-rush (*Eleocharis palustris*) and the dainty annual Toad Rush (*Juncus bufonius*). There were also some ominously large, green, grass-like leaves. These had stationed themselves at the corners of the wiggly bits of the ditch and gave rise to astonishment from many people that they had not been deliberately planted as they were so well spaced and so aesthetically pleasing in their symmetry.

After a few months several thuggish plants could be identified: Greater Reed-mace (Bulrush) (*Typha latifolia*), Branched Bur-reed (*Sparganium erectum*) and one stand of Common Reed (*Phragmites australis*). Sweet Reed-grass (*Glyceria maxima*) also began to take over a small ditch at right angles to the Wiggly Ditch. In the second year other 'problem' plants emerged. Along with the interesting records of Spiked Water Milfoil (*Myriophyllum spicatum*) and Hair-like Pondweed (*Potamogeton trichoides*) was the unwelcome Canadian Pondweed (*Elodea canadensis*), which grows so fast that it out-competes native waterweeds, and the algal Blanket weed (*Spirogyra spp*). Looking like green cotton wool, although this is grazed by minute creatures and provides a refuge for slightly larger ones, it also threatens to use up the water's oxygen supply and exclude sunlight from plants growing beneath.

On the muddy bank further new finds emerged: Marsh Speedwell (*Veronica scutellata*), a rare plant previously unrecorded in this area, and a stunning array of low fleshy plants like Sharp-flowered Rush (*Juncus acutiflorus*) and False Fox-sedge (*Carex otrubae*). In one place a patch of Creeping Jenny (*Lysimachia nummularia*) appeared.

In the third summer the lush green growth of the Bulrushes began to worry us. Excessive growth of algae in the water is probably the result of nutrients

leaching from the surrounding soil, which we know was enriched by chemical fertilisers in recent years. Bulrushes are one of those plants so useful in colonising and helping the natural process of succession, whereby one plant community gives way to another successively until the climax vegetation (usually woodland) appears when conditions are favourable. They are useful in poor soils because they, like Alder, have the ability to fix nitrogen from the air. In the case of Bulrushes they then release it into the water. During summer 2002 the Bulrushes seemed to be dominating certain areas of the ditch, yet a closer inspection found a new floral record: the Pink Water-speedwell (*Veronica catenata*) which encouraged us not to panic about the Bulrushes just yet! There were plenty of Bulrush Wainscot moths (*Nonagria typhae*) too!

Dragonflies

Vicky Hale, a young Environmental Science graduate with an interest in dragonflies, had been surveying various sites nearby for her final year project, and included the Ten Acre ditches in her survey. We were excited to discover the rare Hairy Dragonfly (*Brachytron pratense*), the Emperor (*Anax imperator*), the Emerald Damselfly (*Lestes sponsa*) and the Black-tailed Skimmer (*Orthetrum cancellatum*) all enjoying the new stretches of water.

Further studies developed in 2002 when Tony Smith generously gave his time and expertise to assist YACWAG's Trustee, Ken Blake, in undertaking a survey of aquatic invertebrates in both ditches. This established the presence in their larval stages of Ruddy Darter (*Sympetrum sanguineum*), Variable Damselfly (*Coenagrion pulchellum*) and Black Darter (*Sympetrum danae*) providing further excitement, as Ken had not seen the adult form in this area. Dragonfly books seem to indicate that the Black Darter frequents acid peaty pools for breeding (Randalph, 1992; Powell, 1999) but as with many observations made in the field we can only conclude that the dragonflies have not read the books!

Ten species of aquatic snail were recorded and fourteen species of water beetle, including *Hydaticus transversalis* and *Helochares punctatus*, both of which are notable species. Ken confessed that his favourite find was the Mighty Atom (*Plea leachi*), simply for the interest of its English name.

So our water features were good value, but what about the much bigger spaces in between?

To graze or not to graze

That was the question. We found that people were horrified by the long grass in our fields. Local farmers indignantly said we were "ruining" the field. I

wondered what happened to the concept of leaving land fallow for a year? How could leaving it alone do any harm?

We knew, however, that grassland must have some kind of management or the processes of nature would turn it into scrub and eventually woodland. Our entire landscape is man-made, and this is especially noticeable in the North Somerset Levels, where the Enclosure Acts converted most of the landscape to permanent pasture. Traditionally grassland management was much different from today. Animals were not so large and heavy – and not so 'fussy' being of a stronger constitution to cope with a harder life. It is not only for their aesthetic appeal that rare breeds are favoured for conservation grazing. We found that the main difference today, though, is in the stocking density (The Wet Grassland Guide, 1995).

Vole City

From the start we had taken advice from Chris Sperring, MBE, of the Hawk and Owl Trust. His experiments in grassland management at Portbury had resulted in extraordinary numbers of Short-tailed Field Voles which are the preferred food of Barn Owls (*Tyto alba*) and Kestrels, and also part of the diet for many other species, including Buzzard (*Buteo buteo*), Crow (*Corvus corone*), Rook (*Corvus frugilegus*), Weasel (*Mustela nivalis*), Fox (*Vulpes vulpes*), Heron (*Ardea cinerea*), Grass Snake (*Natrix natrix*), Badger (*Meles meles*) and Otter (*Lutra lutra*). The Vole population had exploded in our field, and a pair of Kestrels could be seen constantly hovering over it. With the support and advice of Chris Sperring we decided to try to maintain the vole population. The margins of the nearby Cheddar Valley Railway Local Nature Reserve have been managed as rough grassland 'Barn Owl corridors' for five years. We put up a Barn Owl nesting box on a pole in Ten Acres and to our delight a Barn Owl appeared just 10 weeks later. We therefore hastily erected a second box, as Barn Owls do not live together to raise young, and we had been advised that the male would need somewhere to roost nearby. Sadly we have not yet hosted a pair and the single female Barn Owl moved on. This coincided with a spell of the wettest weather on record and we thought the Voles might be drowning. Wetland can be too wet! The sight of a Barn Owl quartering the field on a cold, misty evening is not one that will be quickly forgotten.

We were also very pleased with the gift she left us in the form of a carrier bag full of pellets. On dissection these have revealed the bones of all three species of shrew: Common (*Sorex araneus*), Water (*Neomys fodiens*) and Pygmy (*Sorex minutus*). There are also Field Voles galore and Wood Mice (*Apodemus sylvaticus*).

The boxes were not wasted as a pair of Kestrels took up residence in one of them in the spring of 2002. The three young that were successfully reared in Ten Acres

were ringed by Chris Sperring in June and flew a few days later. Their healthy weights demonstrated that they had access to plenty of food.

How dense were our voles?

When Chris Sperring told us that a Bristol University PhD student from the Mammals Unit was looking for a site to use for her research into small mammal trapping, we were enthusiastic. We are always pleased to welcome knowledgeable people into our nature reserve and enjoy learning from their observations. Suzy Wilkinson set 40 Longworth live-capture traps per 100 metre transect, as well as numerous hair tubes and footprint tubes (which give proof of the passing of Voles from fur stuck on tape or from their footprints left in poster paint) in Ten Acres and other nearby sites in order to determine the most reliable method for estimating Vole density in a field. Suzy's research was of great interest to us, as it provided useful base-line data, but even more rewarding was her discovery of a Harvest Mouse (*Micromys minutus*), another new record for the SSSI.

Permanent pasture

Our main aim on Congresbury Moor is to provide as diverse a range of habitats as possible in order to encourage and maintain species biodiversity. We can do what farmers trying to make a living cannot do. It is early days yet and we will continue to experiment with the best way to manage the grass. We have tried some cutting and some grazing, leaving good margins for a reservoir of Voles. There is a constant balance between the needs of the various species. Advice on management for harvest mouse is broadly speaking reflected in the way we have been managing the field for voles: they need undisturbed long grass.

In New Croft, next to Ten Acres, two years of hay cutting have restored to the moor at least 25 plants of Knapweed *(Centaurea nigra*), as well as quantities of Tufted Vetch (*Vicia cracca*) and Meadow Vetchling (*Lathyrus pratensis*). Knapweed was presumably a more common sight before agricultural intensiveness progressed to today's level. Most of the fields in the area are either cut for silage several times or grazed permanently; the grass never gets long enough to flower and wild flowers are suppressed and restricted to those that can cope with such intensive management, like Docks and Dandelions. We leave wide margins on all four sides to ensure that some long grass remains for over wintering invertebrates and, of course, the Voles.

It is only a few years since the recent local converts to organic farming stopped using artificial fertilisers. It is to be assumed that regular cutting and grazing the year round without inputs of fertiliser will eventually deplete the soil's nutrients sufficiently to encourage a more interesting flora. It seems to be working for us

in New Croft, but in neighbouring fields you would not know if Knapweed was present, because the cattle would eat it away. This is not the traditional meaning of 'permanent pasture'. Its original meaning was the permanent use of the land as pasture, as opposed to, for example, hay meadow. What we see nowadays are fields that are indeed permanently pasture. They do not get a break from being grazed, even when they are very wet. This inflicted far less damage to the flora when herds were small and could not be fed through the winter. The moor may have provided grazing for all those eligible from the village and still only had thirty cows roaming on it in the summer! Now thirty cattle are penned in one field summer and winter until its grass is 1cm high, and then they are moved on to do the same in the next one, creating a uniform sward that is of little benefit to wildlife.

In a very interesting experiment in Wales to restore high-input/high-output rye grass pasture to natural damp pasture, the Shared Earth Trust adopted a five-point plan. They reduced stocking rates to traditional levels (one third of a livestock unit per acre per annum). They used mainly cattle to encourage patchy growth and kept livestock out of the fields from April to mid-July. They allowed some winter grazing to permit a little poaching to create mini seedbeds, and they stopped mowing for hay or silage. Within six years this regime had developed patchy growth with tussocks of coarse grasses and rushes. A rich variety of plants had returned purely as a result of grazing in this low-intensive way (Shared Earth Trust Conservation Booklet 6).

The Shared Earth Trust found from their invertebrate monitoring that there were about ten times as many butterfly and moth caterpillars and four times as many adult beetles in the grazed areas as in those cut for hay. There were three times as many ground invertebrates. No small mammals survived in their hay enclosures in winter, but in the rough pasture they found an average of 90 small mammals per acre. In July there was little difference – 240 per acre, but once the hay was cut the site became of no value to small mammals (Shared Earth Trust Conservation Booklet 7). We await Suzy Wilkinson's results from our field with interest.

Mowing, like overstocking, produces an inevitable uniformity and we would like to create as much diversity as possible. Inappropriate stocking densities are a common factor, however, in reducing the conservation value of wet grassland, and we have observed this elsewhere on the moor. The effect of 30 cattle grazing a wet field for one day is not the same as that of one cow grazing for 30 days. We have been greatly indebted to farmer Mark Britten for his invaluable help in cutting, grazing and many other tasks (like help in erecting our pole boxes), which without the use of his tractor would probably be impossible. His cattle, however, are a herd and they like to be together (as they have been for 20 years). They are creatures of habit and it has not been possible yet for us to experiment with the low stocking densities tried at Denmark Farm. We are doing the best we can with the tools (and animals) available to us.

Grassland Butterflies

We noticed in 2001 that good numbers of Meadow Brown butterflies (*Maniola jurtina*) had bred in the field. Hundreds could be counted within a small area. Large Skippers (*Ochlodes venata*) had also been seen. Large Skippers, like Meadow Browns, feed on long grass in the caterpillar stage. In 2002 we counted the Large Skippers along one side of the Wiggly Ditch. A 150 metre length of the bund next to the ditch yielded a massive count of over 65 individual Large Skipper adults. In 1999 when we bought the field there were no Large Skippers. This is truly making biodiversity happen!

In 2002 we noticed that Small Skippers (*Thymelicus sylvestris*) were also colonising the field. They are often found in association with Field Voles because their foodplant, Yorkshire Fog (*Holcus lanatus*), is one of the tastiest grasses high in starch that is appreciated by voles. Management recommended for them is very light grazing or no cutting for 2-4 years (The Wet Grassland Guide, 1995). In one corner a Wall Brown (*Lasiommata megera*) has been seen, and in July we saw two Marbled Whites (*Melanargia galathea*) flying in the field. These butterflies cannot be found in nearby fields. Their needs are very specific. The caterpillars feed on different grasses at different stages of their growth. They cannot stand too much disturbance, and of course if the grass is cut for hay or silage the caterpillars are lost along with the food plants.

Conclusion

Only three years have passed and Ten Acres has taken on a completely different appearance. The grass sward is no longer uniform. There are wide marshy margins and tussocks of Tufted Hair-grass (*Deschampsia cespitosa*) and Hard Rush (*Juncus effusus*) are appearing.

One can stand at the gate at twilight and through half-closed eyes imagine the moor as it used to look long ago. The birds seem to think so too. We have noticed that the assemblage of birds attracted to Ten Acres has changed with the management. Whinchat (*Saxicola rubetra*) have become regular winter visitors. Wheatear (*Oenanthe oenanthe*) visit during the summer and autumn. Stonechat (*Saxicola torquata*) and Reed Bunting *(Emberiza schoeniclus*) can be seen perching on dried dock stems as they hunt for insects. Jack Snipe (*Lymnocryptes minimus*) and Snipe take refuge and feed in the ditches. For a few weeks in the late spring of 2002 two or three Cuckoos were regularly spotted sitting on our 'raptor perching posts' or chasing each other round the field. Later in the summer large flocks of Swallows, Swifts and House Martins swooped over the field gathering up flying insects.

A Buzzard is calling overhead. Two Kestrels are within view, each hovering silently over some hapless small mammal. A Heron is standing in the ditch. It is rough and damp. It looks like a moor!

References

Beisly, P. (1996) *The Northmarsh of Somerset.* Weston-super-Mare Heritage Centre

Broomhead, R.A. (1999) *A Documentary and Archaeological Survey of Two Recently Acquired Sites in Yatton and Congresbury.*

Campbell, M. (1997) *A Survey of the Ancient Parish of Yatton.* Yatton History Society.

Hildich, M. (March 2001) *Desktop Study and Management Plan for the Gang Wall* (SMR 8068)

Kirby, P. (1992*) Habitat Management for Invertebrates.* RSPB.

Powell, D. (1999*) A Guide to the Dragonflies of Great Britain.* Arlequin Press.

Randolph, S. (1992*) Dragonflies of the Bristol Region.* City of Bristol Museums and Art Gallery/BRERC

Storer, B. (1972) *The Natural History of the Somerset Levels.* The Dovecote Press Ltd

Transforming Intensively Managed Grassland. Conservation Booklet 6. The Shared Earth Trust. Lampeter.

Restoring and Managing Damp Pastures. Conservation Booklet 7. The Shared Earth Trust. Lampeter.

Strachan, R. (1998) *Water Vole Conservation Handbook.* WCRU

The Wet Grassland Guide. (1995) RSPB.

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Changes in the populations of the main groups of organisms in a garden pond

Robert Muston

After the completion of a garden pond in 1998, records of the appearance of frogs, insects and algae were kept until the summer of 2001 when it was decided to study in a more systematic way the pond life that had appeared with emphasis on the micro-organisms. The aim of this study is to record the populations of the main groups of organisms in a garden pond. Fish were not introduced as they are known to have a considerable effect on the plant and plankton communities.

Introduction

The pond under study is small. Approximately oval, it is about 2m long by 1m wide. The bottom is undulating and varies from 0.5m to 1m in depth, ensuring that the pond will not freeze solid.

There is a shallow border for semi-immersed marginal plants, and a large sloping stone, partly in the water to allow frogs and toads an easy way to dry land, and to provide an escape route for animals such as hedgehogs which have been known to fall in ponds and drown.

Objectives

It was decided to investigate the changes in pond population over a season by identification of the organisms whilst looking for any patterns. The regions existing within a pond are discussed towards the end of this paper. The three which were selected for examination were:-

- a trawl from the bottom of the pond
- a microscopic examination of the algae growing around the rim
- a microscopic examination of the micro-fauna and flora living on *Lemna* root. Common Duckweed).

Methods

Collection of detritus

It was essential to disturb the water as little as possible. The pond is small and delicate creatures such as damselfly larvae could be suffocated if too much mud was stirred up. There is also the risk that any sweeping of the net might physically damage them.

The collection, including water retained in the net, was then placed into a white plastic trough. In order to allow the sediment to settle to one side of the trough,

it was left for about two hours, propped up at one end. The trough was also covered with black plastic sheeting to simulate the gloomy conditions at the bottom of the pond. After 2 hours, the sheet was kept in position, but the trough was lowered, care being taken not to stir the silt. This was done in the expectation that creatures would move around the relatively unmuddied trough bottom and become more visible. The catch was then sorted into a smaller trough so that they could be seen and sorted with greater ease. Young newts and insect larvae were logged first and returned to the pond as soon as possible

Collection of fringe algae

(*Oedogonium* with *Mougeotia* occurring from March onwards)
This grew just below water level at the edge of the pond. It was collected by hand, and kept in a crystallising basin. (This is a round flat-bottomed glass receptacle, about 1.5cm deep and 6cm in diameter.) Sufficient algae were chosen at random from this collection and placed on a microscope slide. Using mounted needles, it was then teased out until a layer had been evenly spread over the middle third of the slide. 2 drops of prepared pond water were then added followed by an 18mm square cover slip. A small stock of pond water was available for adding to slides. This was prepared before hand by boiling and decanting into a small bottle until half filled. This was shaken thoroughly to oxygenate it. Immediately before use, 30 drops was put in a solid watch glass and 10 drops of methyl cellulose was added and stirred in. (Methyl cellulose is a viscous medium used in slide preparation to slow down the movement of organisms.)
The algae under the cover slip were then scanned at x40 to get a broad overview of what was there and also to check that the slide preparation was satisfactory. It was then systematically re-examined at x100 and a record was kept of findings. For the identification of smaller objects, and for objects of interest a magnification of x400 was used.

Collection of *Lemna* root

Plants were collected by hand and those with a 3cm root were then retained for subsequent examination. The whole plant was placed on a slide and positioned so that the underside of the leaves were visible as well as all the root – this ensured that the whole of the root was visible. (Whenever *Vorticella* colonies were found, these were invariably on the uppermost section of root immediately below the leaves.) Several attempts sometimes had to be made before a satisfactory preparation was obtained.
2-3 drops of prepared pond water was added and covered with an 18 mm square cover slip. It was then scanned at x40 and systematically re-examined at x100, a record being kept of findings. For the identification of smaller objects, and for objects of interest a magnification of x400 was used.

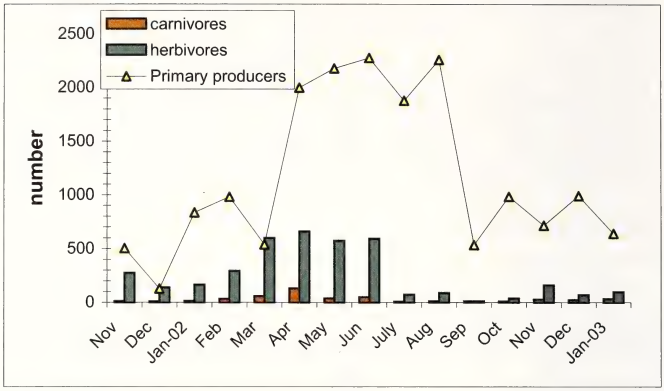


Fig 1

Results

Primary Producers *are green plants such as phytoplankton, algae, microscopic plants, pond lilies, etc., which manufacture food through photosynthesis.*
Herbivores *include small crustaceans, nymphs, and some types of insects that feed on the plants and algae.*
Carnivores *include newts and many insect larvae including mayfly and damselfly larvae that consume herbivores.*

Fig 1 shows the total number of carnivores, herbivores and primary producers recorded on a monthly basis. Primary producers obtain energy through photosynthesis and are the ultimate source of energy for all other organisms Because of this distinction, that population has been emphasised by plotting the population as a line. The graph shows some interesting variations.

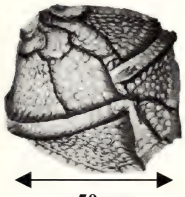
- Overall more primary producers March – September than in the period September -March. This coincides with a period of longer day length and higher temperatures. This increase is observed in all three sample areas of the pond.
- Note how there are greater numbers of primary producers, fewer herbivores and even fewer carnivores. This also indicates a representative and relatively unbiased sampling of the group.
- The herbivore population is high from March through to June

- The records from September through to January 2003 show a return to similar levels in November to January 2002. However, it is intended to keep records for the foreseeable future, and a discernible pattern for this period may emerge after a few years.

- In July, the primary producer population is high whist the herbivore and carnivore populations are low. This fits with a typical food web when the primary producer population would fall before those of herbivores and carnivores.

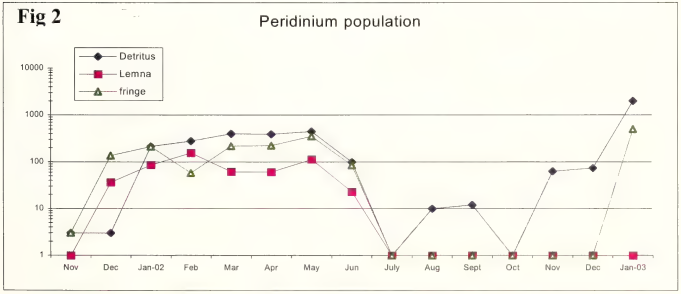
- Newts and dragonfly larvae are also to be found within the algae, not surprisingly as they are carnivores, but newts are very timid and disappear into the depths as soon as they detect any movement – adept at evading capture, it is unlikely that any accurate count of numbers has been made.

Peridinium



This interesting single celled organism, quite fascinating to watch, is found in numbers at all times except late autumn. Fig. 2 shows the population throughout the survey period. For each location the population remains fairly constant although the *Lemna* population peaks in February and then declines. As *Peridinium* is free swimming, its presence around *Lemna* is accidental. The algal fringe population is much more variable and is probably due to the rise and fall in water level causing drier and wetter alternating periods. Population in Fig 2 has been plotted on a logarithmic scale so as to include all figures clearly.

Fig 2



Figs. 3 & 4 display the micro-population from November 2001 – January 2003. A steady increase in protozoa, diatom and rotifer population is seen in March 2002 through to May, with desmids suddenly peaking in February and March. After a drop in mid-April, the diatom population peaks in June. Few *Peridinium* are observed during late autumn and during this time, a population consisting of *Chlamydomonas* (75%) and *Euglena* (25%) was observed, and peaking in November. Fig.4 shows an important ecological pattern in ponds known as algal succession where the seasonal succession of algae is shown here by changes in population of desmids and diatoms. Desmids are more predominant in January to February / March and thereafter decline as the population of diatoms increases to a peak in August.

Fig 3

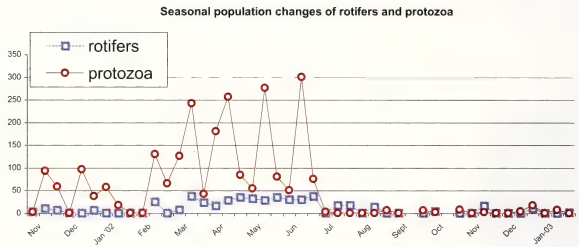
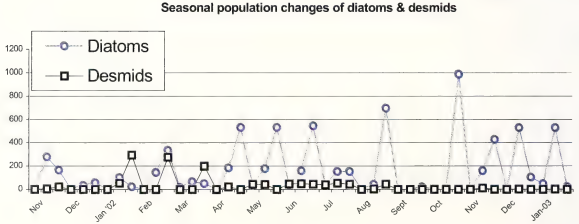


Fig 4



Figs 5-8 are population curves for other groups of animals found in the pond. With the exception of flatworms, all groups become more abundant in the early part of the year, declining in the autumn. To facilitate comparison, the curves have been plotted on the same axes.

Fig 5

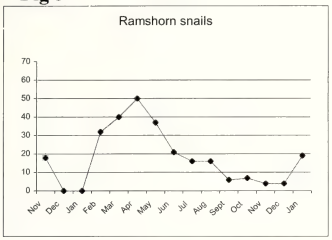


Fig 6

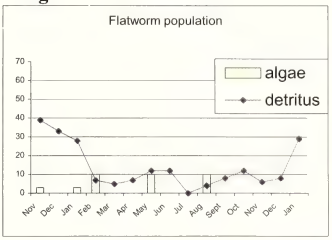


Fig 7

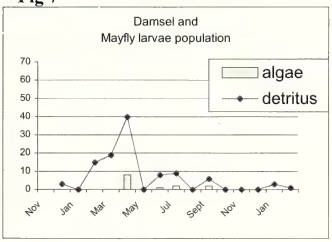
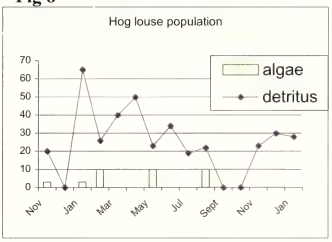


Fig 8



These animals are neither to be found in free water and they are too large to be found on *Lemna* root. Although they sometimes occur near the surface, usually during the warmer months, they are normally to be found on the bottom.

Discussion

Periodic cycles were found.

- A peak in hog louse population in February indicates a hatching season (records show a sudden appearance of 2mm individuals), and the population of ramshorn snails rises in May.
- Flatworm population increases during winter months when decaying vegetation is abundant. The flat worm is a detritivore.
- Ramshorn snail population peaks in May, although why this should be is not clear.
- Herbivore / primary producer cycle between March and June.
- Damselflies appear nearer the surface in April and May. This time is near to the emergence period when the larvae are to be found closer to the surface. *Pyrrhosoma nymphula* appearing first, with *Ischnura elegans* and *Coenagrion puella* appearing a month or so later. Records show that the first *P. nymphula* appeared in late April 2002.
- The desmid population peaks in February / March whilst the diatom population peaks in November: both are photosynthetic organisms with a need for nutrients. Diatoms also need SiO_3^{2-} to grow.
- *Peridinium* numbers dropped in the autumn being replaced with *Euglena*
  and *Chlamydomonas.*
- The marked lack in photosynthetic activity indicated by the low population of primary producers arises from shorter day length, gloomier weather and lower temperatures.

How representative of the pond as a whole were the samples taken?

- The fringe algae population showed considerable variation possibly explained by a rise and fall in water level due to alternate evaporation and filling with rain.
- No collection was made from free-water. (This has been done since September 2002.)
- Decreases in the *Lemna* root population might arise as a consequence of spurts of root growth resulting in lengths of sparsely populated root.

- The appearance of the damselfly larvae in March occurs 4-6 weeks before emergence. They are likely to be nearer the surface, and more easily caught at this time.
- The number of newts caught was very small as they are adept at evading capture. A better way of trapping them must be found before any valid results can be obtained.

Data handling

- A survey such as this is in no way complete after such a short period of 15 months. Further studies should take over an extended period of a few years, as only then will seasonal cycles appear. This is particularly the case as the pond is so new and is still evolving.
- Are the samples taken sufficiently large?

Further work

- The change in diatom, protozoa, and desmid population may be part of a longer cycle yet to complete. The study will therefore be extended over a longer period so that any cycles may be observed a number of times. The free water will soon be sampled by taking a vertical sample from the bottom to the top.
- The Ramshorn snail data should be recorded in greater detail taking records not only of abundance but also physical size (e.g. shell radius and aperture diameter) throughout the year.
- A more systematic way of collecting organisms from the free water zone should be used. These organisms also should be counted in a more precise way, perhaps using a haemocytometer to obtain a population figure per litre for each organism.

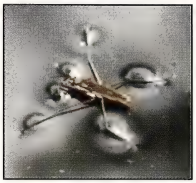
Azure Damselfly
Ischnura elegans

Pond biology

A pond is a small body of standing water shallow enough for sunlight to reach the bottom, thus allowing the growth of phytoplankton and rooted plants.
An undisturbed and healthy pond is recognised by its abundant and rich variety of plant and animal life, ranging from microscopic bacteria to insects, fish, and amphibians. At this stage, the water is nutrient rich and the cycle of life is rapid.

Six distinctive habitats can be found within the pond community, of which only three were selected for this study. The three habitats discussed each have their own fauna and flora as will the others not discussed earlier.

The **surface film habitat** is located on the surface of the pond water. This is the habitat of air-breathing floating animals (insects) such as Water Boatmen, and Pond skaters.



Pond Skater
Gerris sp

The **open-water area** is surrounded by plant life and ends where vegetation is dense and rooted into the soil. Here are found free-swimming organisms such as fish, insects, small microscopic plants and animals that drift suspended in the water. Phytoplankton mostly consisting of a variety of algae is the basic food within ponds with small suspended animals such as tiny crustaceans, insect larvae, rotifers, and other invertebrates feeding on the algae, in turn becoming food for larger pond animals.

The **bottom** of standing water ponds, particularly those in gardens are characterised by muddy or silted bottoms, inhabited by insect larvae and a variety of micro-organisms. Many of these animals burrow into the bottom whilst others such as dragonfly larvae, annelids, small shellfish such as *Pisidium* together with a large population of bacteria feeding on detritus. When the water is turbid, light is not able to penetrate very far and may not reach the bottom, preventing plants from growing and reducing the availability of shelter.
The **littoral habitat** extends from the waters edge outward as far as rooted plants grow and is the most diverse region in the pond community. Plants include grasses, sedges, rushes, flowering plants, and found amongst the roots are algae, protozoa, worms, insects, snails, and amphibia.
The **floating-leaf plant zone** is made up of broad, flat-leaved water lilies, water ferns, and duckweed. Animals such as snails, beetles, and mayflies, various larvae and eggs may be found underneath the largest of these, together with a variety of filamentous algae. Roots extending down provide a micro-habitat of considerable interest to the microscopist.

The **submersed plant zone** is the area of vegetation that surrounds the centre of the pond. Any plants will have leaves that are long and slender, or bushy and branched.

The hornworts (*Ceratophyllum* sp) frogbit (*Hydrocharis morsus-ranae*) and crowfoot (*Ranunculus* sp) are some of the flowering plants found in this zone. Frogbit has the ability to over-winter as submerged buds called turions. These winter buds are terminal shoots in which the leaves are situated very close together acting as a stored food supply.

turions

The organisms can be grouped into **trophic levels.** Living things interact with each other by feeding on one another: therefore, energy, compounds, and chemical elements are transferred from creature to creature along the food chains.

In the study of freshwater biology, textbooks often make little or no mention of ponds (e.g. Moss, 1988). In Great Britain, permanent ponds in British countryside are of different kinds (in size, purpose, situation and location) but we are most familiar with garden (which tend to be smaller), village (larger), farm (muddier) and dew (shallower). They are numerous (estimated to be about 800,000 in 1880s based on 1:12,500 maps and 2-12 per square mile based on 1:25,000 maps (Rackham, 1986). Many may have been filled in, but others, especially those in suburban garden ponds, will have been dug. Such small ponds, although overlooked for much serious ecological research, are important for sustaining populations of amphibians including Red Data and BAP species such as the Great Crested Newt. (Ansell *et al.,* 2001)

Although Natterjack Toads require temporary ponds, newts require permanent ones preferably small ones without fish, the absence of fish being particularly important for Great Crested Newt (Beebee and Griffiths, 2001).

Appendix **Species List**

Blue-green algae

Spirulina
Oscillatoria
Tolypothrix

Free floating algae

Chlorella
Chlamydomonas
Eudorina
Euglypha
Pandorina
Coelastrum
Pediastrum

Filamentous algae

Spirogyra
Mougeotia
Oedogonium
Stigeoclonium

Other algal forms

Cylindrocapsa
Chaetophora
Diatoms *Cymbella*
Gomphonema
Amphora
Pinnularia
Dictosphaerium
Scenedesmus
Navicula
Desmids *Closterium*
Cosmarium

Protozoa

Amphileptus
Coleps
Colpidium
Peridinium
Gymnodium
Euglena
Paramoecium
Stentor
Euplotes
Vorticella
Didinium
Class Heliozoa:
Actinophrys?

Coelenterata

Hydra sp (brown hydra)

Gastrotricha

Chaetonotus

Rotifers

Brachionus
Euchlaris
Rotaria
Mytilena
Colurella

Flat worms

Polycelis
Dugesia

Nematoda

Annelida
Oligochaetae
Leeches

Mollusca

Planorbis crista (A ramshorn snail)
Planobarius (A ramshorn snail)
Limnaea (Pond snail)
Pisidium (Pea cockle) *

Crustaceae

Daphnia
Macrothricidae
Cyclops
Asellus
Gammarus

Chelicerata

Limnesia? (mite)

Insecta

Gerris sp (pond skater)
Notonecta sp (water boatmen)
Coenagrion puella (Azure Damselfly)
Ischnura elegans (Blue-tailed Damselfly)
Pyrrhosoma nymphula (Large Red Damselfly)
Family Syphidae (hoverflies) including:
Eristalis sp (as Rat Tailed Maggot)

Amphibia

Triturus vulgaris (Smooth Newt)
Bufo bufo (common toad)
Rana temporaria (common frog)

Mammalia

Erinaceus europaeus (hedgehog)
(eating frog spawn at night)

* This population of *Pisidium* died out during the autumn of 2001, and has not re-appeared

Large Red Damselfly
Pyrrhosoma nymphula

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References

Ansell, R.,Baker, P. and Harris, S. (2001) *The value of gardens for wildlife - lessons from mammals and herpatofauna.* British Wildlife 13 77-84

Bayly, I.A.E. and Williams, W.D. (1973) *Inland Waters and their Ecology*. Longman, Camberwell.

Beebee, T. and Griffiths, R. (2000) *Amphibians and Reptiles*. New Naturalist Series No. 87. HarperCollins, London.

Borradaile, Eastham, Potts and Saunders (1963) *The Invertebrata* Cambridge at the University Press

Bronmark, C. and Hansson, L-A (1998) *The Biology of Lakes and Ponds* Biology of Habitats, Oxford

Brooks, S. (1997) *Field Guide to the Dragonflies and Damselflies of Great Britain and Ireland.* British Wildlife Publishing

Carpenter, S.R. and Kitchell, J.F. (1985) *Cascading trophic interactions and lake productivity.* Bioscience 35 634-639.

Croft, P.S. (1986) *A key to the Major Groups of the British Freshwater Invertebrates.* Field Studies Vol.6 No.3

Cross, J.W. (2001). *The Charms of Duckweed.* http://www.mobot.org/jwcross/duckweed/ (May 19, 2002)

Crumpton, W.G. and Wetzel, R.G. (1982) *Effects of differential growth and mortality in the seasonal succession of phytoplankton populations in Lawrence Lake, Michigan*. Ecology 63 1729-1739.

Edmondson, W.T. (1959) The Rotifera. *In Freshwater Biology*, by H.B. Ward and G.P. Whipple, new ed. Edited by W.T. Edmondson (Wiley)

Fitter, R. and Manuel, R. (1986) *Collins Field Guide to Freshwater Life*. London: Collins

Garnett, W.J. (1965) *Freshwater Microscopy* London: Constable

Gauthier, G. (2002) *Les Fleurs d'eau*
http://www.jardins.versicolors.ca/fleurdo/html/pond_ecology.html

Hammond, C.O. (1983) *The Dragonflies of Great Britain and Ireland* Harley Books

Lewis, J. (2001) *Curriculum Units* http://www.yale.edu/ynhti/curriculum/units

Mackinnon, D.L. and Hawes, J. (1961) *Protozoa* The Oxford University Press

Macan & Worthington (1974) *Life in Lakes and Rivers* Collins

Moss, B. (2001) *The Broads*. New Naturalist Series No. 89. HarperCollins, London.

Moss, B. (1988) *Ecology of Fresh Waters (Man and medium)* Blackwell Scientific Publications, Oxford

O'Kelly, C. et al (2001) *The protista gallery*
http://www.bch.vmontreal.ca/protista

The Pond Conservation Trust (2003) *Working together to Create a future for ponds*. http://www.pondstrust.org.uk/

Pentecost, A. (1986) *Introduction to Freshwater Algae* Richmond, Surrey: Richmond Publishing Co.

Rackham, O. (1986) *The History of the Countryside*. Dent, London

Randolph, S. (1992) *Dragonflies of the Bristol Region* City of Bristol Museum and Art Gallery

Rothhaupt, K.O. and Güde (1996) *Influence of metazoan zooplankton on the microbial community before and after the onset of the spring clear water phase in Lake Constance (Bodensee)*. Archiv für Hydrobiogie. Special Issues: Advances in Limnology 48 21-30.

Smith, P. (2001) *Can fish determine the conservation value of shallow lakes in the UK?* British Wildlife 13 10-15

Wetzel, R.G. (2001) *Limnology: Lake and River Ecosystems*. 3rd edition. Academic Press, San Diego and London.

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The Bristol Avon Otter Survey

Simon Reece

Background: the decline to 1977

Precisely how the population of Otters (*Lutra lutra*) on the Bristol Avon fared during the severe decline of the '60s and '70s is not known and can be only guessed at. Routine survey work prior to that time was non-existent and any records of otter distribution are largely anecdotal. There is, however, a useful source of information provided by the hunt that operated in the area. Although data was not systematically collected, it does give some sort of picture of what happened. A privately published history of the pack indicates that they operated in Hampshire, Wiltshire, Dorset and a small part of eastern Somerset. In 1924, 'the whole country was so well stocked with Otters' that portions of it were lent to other hunts. The pack retained the Somerset Frome and certainly by the end of the war had recovered their access to the rest of the Bristol Avon, though they never went on any of the tributaries further downstream than Bath. In 1951 'otters were everywhere'. There is insufficient information to make specific references to our catchment, but in the whole of their country in 1953, 56 were found in 71 days, regarded as a very high proportion. Numbers found went on up, and peaked in 1955, when 64 were found in 62 days. In 1958 the first Mink was found, on the Midford Brook. By 1960, the numbers of Otters found had dropped to 33 in 64 days and there were increasing references to Mink being found. By 1963, some of the most reliable streams were blank and in 1964 it was noted that 'many of the rivers were being dredged, with consequent destruction of cover.' The loss of places to hunt caused by these drainage works, amongst other reasons, led to an amalgamation with another hunt and an area at least twice the size became available, but the numbers of Otters found continued to decline. In 1967, the hunt records that it was very much worried by the numbers of Mink.

Concern for the declining population was so great by 1969 that the Mammal Society became involved. A policy was adopted to find as many but to kill as few Otters as possible in an attempt to monitor further changes in the population. At this time, there being no organised surveys, much of the monitoring was being done by hunts and the Mammal Society was sent the data at the end of each season.

In 1971, the numbers found in the whole hunt country was down to 8, the lowest number to which it ever fell, and the hunt heard with dismay that two had been shot on the Marden Brook, a tributary of the Upper Avon. Drainage and

abstraction continued to do damage and a number of streams started to show severe effects of low flow rates.

There are only two records of Otters found in the Avon catchment after the decline had begun. One was on 9th August 1961 at the junction of the Norton St.Phillip Brook and the Wellow and the other was on 1st June 1964 above Weavern on the By Brook. The absence of any further finds may in part have been caused by the hunt ceasing to meet in the area, but it does tend towards the conclusion that to all intents and purposes there were exceptionally low numbers on the Avon, if any at all.

Throughout the '70s numbers found generally gradually rose again. 14 were found in 32 days in 1977, the last year of operation, as the Otter was then placed on the protected list. Throughout the whole of the '70s the hunt only caught two.

The reasons for this decline were probably multi-factorial, but the familiar role of pesticides is particularly implicated. Habitat destruction by dredging increased land drainage and water abstraction must all have contributed and the effect of an increasing number of Mink has remained a debating point. Improvements have been made in a number of areas over the years and a recovery in numbers has occurred throughout England, resulting in a flurry of press reports recently.

The situation in the 1980s and '90s

It would appear that otters did not, in fact, become totally extinct on the Bristol Avon. In the '80s there were a very small number of sightings either on Chew Valley Lake or nearby, but no evidence was found to suggest that these were anything other than itinerant individuals. There are a couple of other isolated reports elsewhere in the catchment, but nothing remotely representing a sustainable population. It seemed as though there were occasional animals passing through the region, nothing more.

In 1990 a number were released on the By Brook, a stream that has particularly good habitat. Little seems known of where these Otters went or what became of them, but it might be possible that some of them survived to increase numbers locally. However, evidence was at last discovered on the Chew, Boyd and the main river in between, and also on the main river near Bath. In 1991, a decomposed corpse of an adult bitch was found on the Chew. She had bred, although was not then pregnant. Was she itinerant, or were her cubs living successfully on the stream undetected? Where was the dog that fathered the cubs? The members a local fishing club had nothing to report, other than

sightings of Mink, and as far as they were concerned there were no stories of Otter evidence at all.

The start of the Bristol Avon Otter Survey

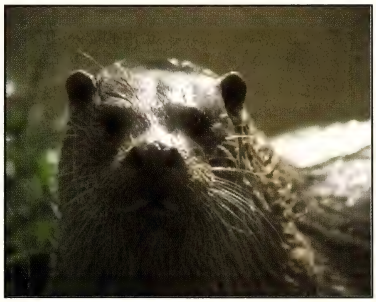
In 1999, following discussions with the Somerset Otter Group, it seemed sensible that regular surveys should be undertaken north of the Mendips. Surveys had become positive on the south side sufficiently often to suggest that it would be worth looking more systematically in North Somerset, where there had also been sporadic evidence throughout the previous two decades. The Congresbury Yeo was found to be positive regularly along its whole length, evidence including the killing of an adult bitch by traffic on the A38 at Perry Bridge just before Christmas. When the North Somerset Otter Group formed in the autumn of 1999, attention turned to the Chew and positive evidence was found for the first time in early 2000.

It then became clear that surveying one tributary of a large river was of limited value. The Avon's course is roughly circular. It rises on the Cotswolds near Sherston and runs east, then south, finally swinging west to the Avon Gorge and its meeting with the Severn. Its neighbours include the Thames in the northeast, the Wylye and Salisbury Avon in the southeast and the Brue and on to the Somerset Levels in the southwest. It seemed much more appropriate that it should be approached in the same way as Otters do: with no regard for human boundaries. It was decided to attempt to look at the whole catchment and the Bristol Avon Otter Survey came into being in May 2000. It is attempting, by as close to 'constant effort monitoring' as possible, to address one simple question: are otters present or not, month by month?

Methods and dilemmas

How is it done? Otters are fairly straightforward to monitor on a simple presence or absence basis, provided one knows what to look for and where to search. Otters advertise their presence to others to indicate claim over 'fishing rights' and to keep in touch with each other for meeting or mutual avoidance. As their range may be many miles long, but only the width of a stream wide, laying claim to it poses problems as a great part of it is always going to be remote from the animal in question. Spraints (Otter faeces) contain scent that conveys information to other individuals. It is therefore in the Otters' interest to place these in the same places and where they are likely to remain for several days, enabling the message to last through time and be easily found. Sprainting sites thus become traditional and are often sheltered from rain by overhanging tree roots or bridge arches. The survey technique involves monitoring likely sprainting sites every month, recording if any spraints are present, and if so,

making some sort of judgement about how long ago they were deposited. There are other signs as well, amongst which the characteristic, rounded, five-toed pad mark is the most likely to be found. Sightings are very rare, but some observers are lucky. Perhaps the most exciting was of a big Otter that went down the Avon almost to St Annes in early 2001, suggesting that it might not be long before Bristol itself can add this species to its list of fauna.



Little more than presence or absence can be established. Spraint numbers raise as many questions as they answer. What is the correlation between numbers of spraints and numbers of Otters? Do Otters produce proportionately more or less spraint as the density of animals changes? Are there any seasonal variations? Is there any variation by sex, age or breeding condition? Does absence of spraints indicate no Otters? For example, a very regular site on the Chew was blank in November 2002 after a nearly consecutive 30 months of regular sprainting. This followed the death of an adult bitch on the road at the watershed upstream. The site was flooded in December, but in January there were pad marks in profusion and 7 spraints. In February 26 spraints were found, 3 times as many as the most ever found at the site. How can this be interpreted? The death of a resident followed by an incomer establishing itself? Cubs becoming independent? A dog exploring new territory? A chance variation?

It is not the intention of the project to address these questions, although it is stimulating to think about them. The value of the work will emerge in the long term. It is exciting to think that if Otters spread through the catchment they can be monitored, but it also should provide an early warning system for any sudden disappearances that might occur, just as the otterhunters had done back in the '60s. As Otters feed at the top of food chains, if they are present, healthy, breeding and in good numbers, it implies that the food chains on which they depend are also in good order. This makes Otters a useful indicator of general environmental health adding another important dimension to the purpose of monitoring their presence.

The first year was one of establishing as much surveyor cover as possible. Nearly all the tributaries downstream of Bath were covered, and many of those all the way to the source. The main river was covered patchily roughly down to

Chippenham. This was followed by foot and mouth restrictions in 2001 when not much could be done. The group lost momentum and when surveys restarted in 2002 the area covered shrank markedly, almost entirely upstream of Bath. Cover at the lower end remained good.

Results and discussion

There seem to be three main concentrations of activity. The first is the three downstream tributaries of the Boyd, Chew and Corston Brook, the second (from pre Foot and Mouth surveys) is the By Brook and the third is the Mells Stream and upper Somerset Frome. But there are always occasional records. The Wellow and Cam have been positive occasionally, as has the Siston Stream, the Bradley Brook and Bathampton Oxbow.

Being hit by traffic is a major mortality factor. When streams flood, Otters travel much more on land, and this includes crossing roads to avoid flooded bridges. Five otters were reported killed on the roads in 2002 in the catchment, but none before and none since. Three were in the northwest, one on the Markham Brook near Abbots Leigh and two on the A38 near the Barrow Tanks. The two, both adult, one dog, one bitch, on quite separate dates, suggest that the animals were crossing the watershed of the Avon with the Land Yeo. It may be that this is where Avon Otters link with the neighbouring catchment and spraints on the Barrow Gurney stream support this theory. The one at Abbots Leigh was a large dog and subsequent searches suggested that he had been on this tiny stream for a while, perhaps living on fish from various nearby lakes or going down into the Avon estuary to feed.

Another adult bitch was killed on the watershed above the Mells, perhaps linking with the Brue. The fifth, a large dog, was near Chippenham. He was crossing overland between the Avon and the Marden and is the only definite evidence of an Otter upstream of Bathampton since the survey began. While all these losses are distressing, it does at least show that there are Otters about.

To balance this, three litters in the last three years have been recorded, each of two cubs, two of which are almost certainly from the same bitch. This can be nothing like the level of recruitment needed to sustain losses at the rate represented by those road casualties. None have been run over in the floods of December and January and whereas this is obviously very good news, it could also suggest that the numbers in the Avon and its tributaries remains very low. Road kills could well prove to be a severe factor limiting recovery.

Post foot and mouth, the surveys show a lot of surveyor distribution bias. It is hard to persuade people to survey regularly when all seems blank, but negative

data is very important. To be meaningful, the project needs to re-establish surveys upstream of Bath where very little evidence had been found and that is where future effort must be focused.

In conclusion, the burning question: how many are there in the catchment? In January 2002 we could prove that there were at least six. Since then five have been run over without any real reduction in sprainting. There seem to be few grounds for predicting a number more than somewhere in the 'teens, but for the reasons discussed, this could out by some margin either way. It is a tantalising question, and this work will help to throw some sort of light on the answer as it proceeds through the years ahead.

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Otter (*Lutra lutra): photograph by Charlie Hamilton-James*

Weather report for 2002

R.L.Bland

Annual Temperature

The annual mean maximum temperature was 14.3° C, lower than 1995, 1997, 1999, but above the long-term average since 1920 of 13.8°C

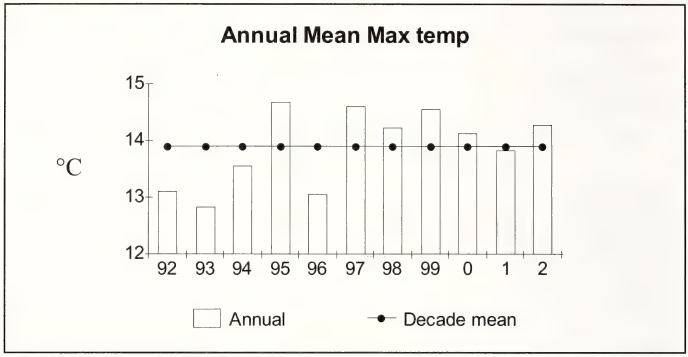

Chart 1. Annual mean maximum temperature for past decade.

Monthly Temperature

January and February in particular were very much warmer than usual, as was November. May, June and July were a little colder than average.

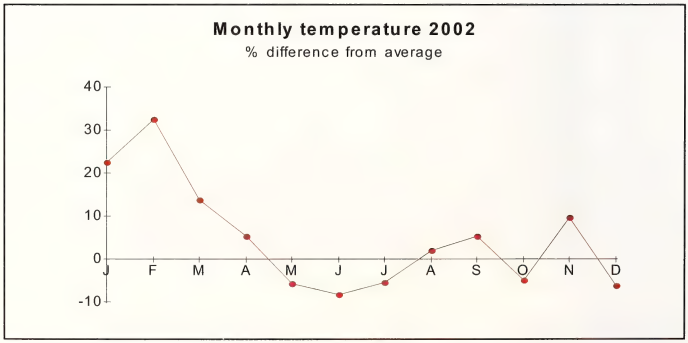

Chart 2 Monthly percentage differences between 2002 and the 1920-2001 average.

Annual Rainfall

Total rainfall at 1178mm was the third highest annual rainfall since 1920, and 30% above the average since 1920. The decadal average for the past decade is 998mm, well above the long term average of 910mm.

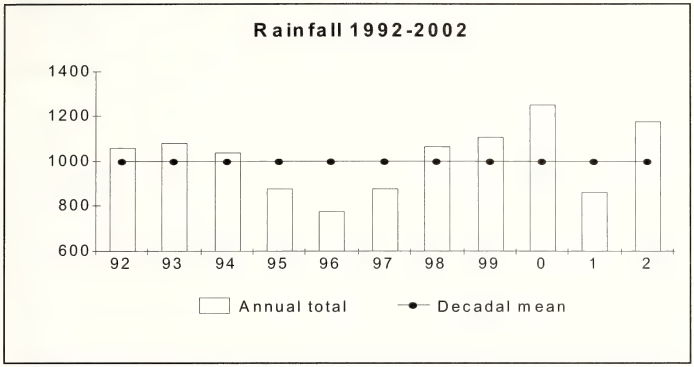

Chart 3. Annual rainfall 1992-2002, with the decadal average, 998mm, for comparison

Monthly Rainfall

January and February were spectacularly wet months, both being records, but the rest of the year saw average amounts. August and September were drier than normal.

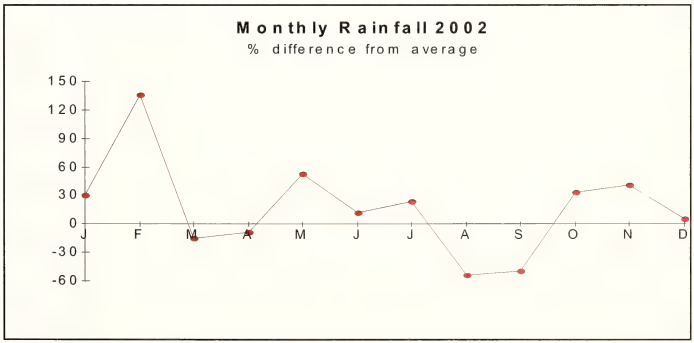

Chart 4 The percentage difference between monthly rainfall and the average for each month since 1920.

Monthly summary

For each month the average maximum temperature is given followed in brackets by the average since 1920, and the total rainfall in mm, followed by the monthly average since 1920 in brackets.

January Temp 9.2°C (7.5°C), rain 115mm (88mm). There were just four frost nights. The month began with a very cold week, but a series of storms swept across the country, producing the wettest January since 1920. The cold of December at first delayed the onset of spring, but by the end of the month catkins were out and frogs in the pond.

February. Temp 10.2°C (7.7°C), rain 151mm, (64mm), the same as 1950, but less than 1923 181mm. There were only two frost nights. A succession of depressions swept across the country. On February 11th 60mm of rain fell, the wettest day of the year. By the end of the month most spring events were up to two weeks early.

March Temp 11.6°C (10.2°C), rain 51mm (60mm). Only one frost night. The temperature reached 16°C on 29th, with bright sunshine and light winds, and migrant birds were coming in. Lilac and bay were in flower before the end of the month.

April. Temp 13.5°C (12.8°C), rain 53mm (58mm), almost all in last five days. There were three frost nights in the first two weeks. The month was dominated by high pressure and N winds until 20th, holding bird migration back markedly. Then low pressure came to dominate with a storm on 28th and 29th. Most spring events were a week early at the end.

May. Temp 15.3°C (16.2°C), rain 98mm (64mm). The month began with northerly winds to 11th that held up late migrants like Swifts, then switched to westerly. High winds and cool temperatures created problems for early broods, and spring events were at normal dates by the end of the month.

June. Temp 17.6°C, (19.2°C), the eleventh coldest June since 1920. Rain 67mm (60mm), but most fell on 6th and 7th. Dominated by weak lows until 23rd when a weak ridge gave clear skies, but kept temperature down to 19°C.

July. Temp 19.7°C (20.8°C), rain 87mm (70mm), most in first week. Began with low pressure dominant but from 13th high pressure took over, though with comparatively little sunshine, and Blackberries were late ripening.

August. Temp 21.0°C, (20.6°C), rain 39 mm, (84mm) Complex lows brought 29mm of rain on 9th but there was no rain from 11th to 30th.

September. Temp 19.2°C (18.2°C), rain 42mm (82mm), dominated by high pressure and N winds, which kept temperatures down.

October. Temp 14.1°C (14.5°C) Rain 139mm (91mm) Dominated by high pressure until 10th, then a series of lows. They produced a good deal of rain from 11th-15th, breaking a long period from 10th September with almost none. Storms on 25th and 27th, which saw a few trees down locally. There were, unusually, two frost nights.

November. Temp 11.4°C (10.4°C), rain 137mm (97mm). Dominated by westerly winds and Atlantic lows. By the end of the month daffodil bulbs were visible in turf.

December. Temp 8.6°C (8.1°C), rain 95 (90mm). High pressure with easterly winds dominated until 20th, keeping temperatures down to around 6°C, though giving only two frost nights. Then Atlantic lows became dominant, the temperature rose sharply to around 12°C, and rain began to fall.

	Max	1920-2001	Difference	Total rain	1920-2001	Difference
	C	C	%	MM	MM	%
January	9.2	7.5	23	115	88	31
February	10.2	7.7	32	151	64	136
March	11.6	10.2	14	51	60	-15
April	13.5	12.8	5	53	58	-9
May	15.3	16.2	-6	98	64	53
June	17.6	19.2	-8	67	60	12
July	19.7	20.8	-5	87	70	24
August	21.0	20.6	2	39	84	-54
September	19.2	18.2	5	42	82	-49
October	13.8	14.5	-5	123	92	34
November	11.4	10.4	10	137	97	41
December	7.6	8.1	-6	95	90	6
Year 2002	14.2	13.8	3	1058	908	17

Table 1 Monthly mean maximum and rainfall figures compared with the average monthly figures 1920-2001, and the percentage differences.

2002 Some weather superlatives

Wettest day	11 February 60mm
Hottest day	29 July 26°C
Coldest day	1, 3rd January 0°C
Sunniest day	15 July 14.9 hrs
Longest cold spell	January 1-4th Four nights frost and ice
Longest dry spell	August 10-30th, twenty days.
Longest wet spell	17-26 January, twelve days.
Frost nights Total	14 nights
Days snow lying	None

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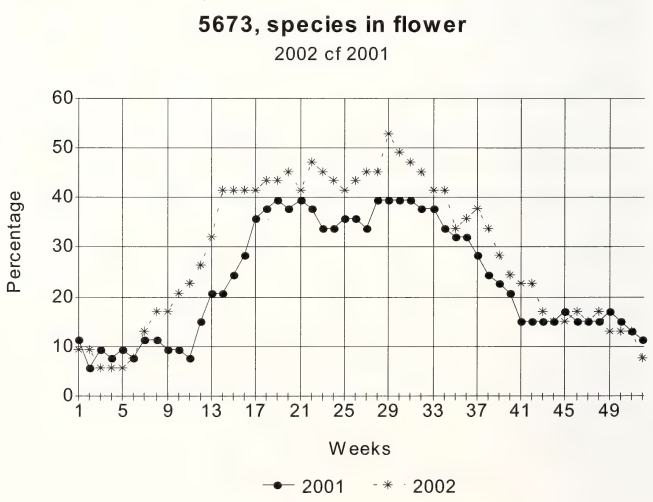
Phenology 2002

R.L.Bland

The weather affects the whole of a plants life-cycle throughout the year. Particular events, such as buds breaking, flowers opening or fruit ripening can all be recorded, but weather also affects the length of the flowering period. Furthermore spring conditions influence the nature of the autumn harvest, and autumn conditions create the buds that will produce flowers in the spring. Thus there is a continuous time lag in the effects of weather on plant life, which may be six months or more. To study phenology it is not enough simply to record key events; it is more significant to note the whole pattern of each year. This pattern is complex, and different for each species. Annuals have a different pattern to biennials, and perennials and shrubs and trees are different again. In 2002 I recorded every wild species that was in flower in every week of the year on a standard walk in Clifton in 1-km square 5673, and compared the record with 2001. The survey covered 53 species observed in both years. The results showed that 2002 was ahead of 2001 throughout the year. More plants were in flower earlier and flowered for longer than in 2001. The average flowering period for the 53 species was 15.0 weeks compared with 12.2 in 2001. Chart 1 shows the difference in the number of species in flower each week of the year.



December 2001 was colder than average, but January and February 2002 were exceptionally warm months, 18% and 25% warmer than average respectively. This had the interesting consequence that early spring events were later than usual, and it was not until early March that events began to be earlier than the recent average. This is shown in Table 1 which compares 2002 dates with those of 1999-2001 and the average of 1998-2001. The twenty events chosen were on average two days earlier than normal, and three days earlier than 2001, but two days later than 2000.

	1999	2000	2001	2002		Avg	Difference
						1998-2001	Days
Snowdrop flower	16/01	23/01	14/01	18/01		22/01	-4
Hazel catkins flower	23/01	12/01	19/01	20/01		23/01	-3
Chaffinch full song	29/01	24/01	29/01	10/02		27/01	14
Hawthorn bud-break	07/02	16/02	09/01	17/02		31/01	17
Frogspawn	06/02	02/02	03/02	22/02		06/02	16
Celandine flower	23/01	14/02	11/01	08/02		09/02	-1
Horse Chestnut bud-break		26/02	07/03	10/03		03/03	7
Alexanders flower	06/02	04/03	25/03	17/02		06/03	-17
Blackthorn flower	27/02	19/02	01/04	10/03		08/03	2
Ash Flower	28/03	11/03	25/03	17/03		25/03	-8
Wild cherry flower		22/03	07/04	24/03		30/03	-6
Bay flower	31/03	01/04	17/04	30/03		06/04	-7
Honesty flower		31/03	15/04	07/04		08/04	-1
Cow Parsley flower	08/04	27/03	18/04	07/04		12/04	-5
Horse chestnut flower	17/04	21/04	22/04	07/04		14/04	-7
Hawthorn flower	05/04	09/04	25/04	07/04		15/04	-8
Sycamore flower		23/04	11/04	07/04		17/04	-10
Ash bud-break	24/04	26/04	22/04	13/04		26/04	-13
Ox-eye daisy flower	02/05	01/05	13/05	04/05		05/05	-1
Elder flower	12/05	16/05	27/05	18/05		18/05	0
Avg of 20 spring events	10/03	14/03	19/03	16/03		18/03	-35

Table 1 Dates of twenty spring events 199-2000

Historic comparison

It is also interesting to compare the dates recorded in 2002 with those for the Bristol region in the 1890s, recorded in the BNS proceedings at the time, and for

those in the area between 1930 and 1947 derived from the phenological report of the Royal Meteorological Society. The dates for the other two periods are averages of dates from a number of sites in the region, and cannot be regarded as exactly the same as the 2002 results from Clifton. Table 2 shows the results. The figures are Julian days- i.e. the number of days after January 1 that the event occurs. There are only eight spring events that were recorded in all three periods, and they show a striking trend towards earlier springs. On average these eight events occurred two weeks earlier between 1890s and 1930-47, and 26 days earlier again between 1930-47 and 2002. The rate of change in days a year almost doubled over the periods involved, and this might be regarded as evidence for global warming. The average maximum temperature of the winter, Dec-Feb, 1888-1893 was 6.4°C, the average for 1930-1946 was 7.6°C, and for 2002 was 8.5°C, or roughly 1°C increase in each period. On the other hand the differences might simply be caused by the accuracy of the observers and differences between the very varied sites used for the observations. Furthermore comparison should be between the average of at least a decade. To be of real value records need to be of the same site by the same observer and preferably of the same plants.

	1890	1930	2002	Diff	Diff
				1930-1890	2002-1930
				Days	Days
Snowdrop flower	74	33	14	-41	-19
Hazel catkins flower	45	25	12	-20	-13
Celandine flower	72	68	11	-4	-57
Frogspawn	68	47	33	-21	-14
Blackthorn flower	101	88	50	-13	-38
Hawthorn flower	129	123	95	-6	-28
Horse chestnut flower	124	119	97	-5	-22
Ox-eye daisy flower	139	139	121	0	-18
Average	94	80	54	-14	-26
Annual rate				0.28	0.52

Table 2 Differences in average dates for eight spring events between 2002 and 1930-47 and 1890-1893

Autumn events

I list in Table 3 twelve selected autumn events comparing 2002 with 2001. The storm of Oct 27th took the leaves off many trees, and hence probably distorted the comparison. The point at which fruit ripen is also less easy to determine than the point at which flowers open, and last sightings are also less easy to record than first ones. However I hope that this record will become more precise in time.

	2001	2002
Blackberry ripe	07/07	21/07
Elderberry ripe	05/08	11/08
Yew berry ripe	28/08	18/08
Ivy flower	31/08	01/09
Whitebeam ripe	23/09	25/08
Gorse flower	23/09	08/09
Ash bare	11/11	27/10
Lime bare	18/11	27/10
Last wasp	24/11	14/11
Beech bare	25/11	27/10
Ivy ripe	09/12	24/11
Oak bare	09/12	14/12
Average	10/10	30/09

Table 3 Twelve autumn events in 5673, comparing 2002 with 2001

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Bristol Botany In 2002

Professor A.J. Willis

The year 2002 was distinctly wet, with total annual rainfall 1058.4 mm, some 22% higher than the long-term (1961-1990) average. February was the wettest month with 150.6 mm of rain and 23 days with more than 0.2 mm rainfall. Other very wet months were January, October and November, but August and September were distinctly dry, totalling only 13 days with over 0.2 mm of rain. Temperatures for the year were somewhat higher than normal; the mean maximum temperature was 14.2°C (0.5°C above average) and the mean minimum temperature 7.5°C (1.2°C above average). December was the coldest month of the year with mean maximum temperature 7.6°C and the mean minimum 4.0°C, having four of the total of the 12 frosts for the year. Sunshine hours were 1605 for the year, more than a hundred fewer than in 2001, with April the sunniest month while June and July were disappointingly less sunny at Long Ashton Research Station to which all the above meteorological records relate.

Although January and February were warmer than average, but very wet, the vernal flora was not much advanced, with flowers of *Helleborus foetidus* **Stinking Hellebore** only barely out by the end of January. **Snowdrops** were starting to flower on the Chew at Coley and *Daphne laureola* **Spurge Laurel** in Cheddar Wood. However, by the start of March *Helleborus viridis* **Green Hellebore** was well open on Lyncombe Hill and in Mendip Lodge Wood, **Daffodils** were beginning to bloom at Shipham and Churchill Batch, *Anemone nemorosa* **Wood Anemone** was just flowering at Shipham, *Lathraea squamaria* **Toothwort** at Mendip Lodge Wood and *Mercurialis perennis* **Dog's Mercury** in several places on Mendip.

In late March 34 plants of *Gagea lutea* **Yellow Star-of-Bethlehem** were flowering at Stoke St Michael, a large decline from 86 in 2001, with no flowering at Littleton Wood, Grandmother's Rock or Murdercombe. This strangely contrasts with the behaviour of the plant in Dorset, where flowering was much better in 2002 than in 2001. At the end of March a few plants of *Helianthemum nummularium* **Common Rock-rose** were flowering on St Vincent's Rocks, some five or six weeks earlier than previous records. *Himantoglossum hircinum* **Lizard Orchid** is thriving at Berrow, with about fifty flowering spikes in 2002, but at Mangotsfield is in decline (10 inflorescences with 26 in 2001 and 39 in 2000) probably because of scrub encroachment. No plants of *Cyperus fuscus* **Brown Galingale** were seen on Walton Moor, where *Juncus effusus* **Soft Rush** is rampant and conservation work needed (all phenological records by RSC).

Records, particularly of ruderal plants, continue to be made, especially in the city of Bristol and its immediate environments, so enabling empty one kilometre grid squares in maps in The Flora of the Bristol Region (2000) to be filled. The persistence of some of the regions rarities such as the **Adder's-tongue Spearwort** is to be welcomed, but the need for conservation measures for several of the rarities is evident. The discovery of a substantial colony of **Round-leaved Wintergreen** is a very notable addition to the flora of v.c. 6 and indeed it is new to Somerset. The arrival of **Marsh Mallow** this year at Sand Bay is of considerable interest and the record of **Green-winged Orchid** on the dunes at Berrow is especially notable for a species with distinctly declining distribution. Other outstanding records include the **Rough Poppy** at Hawkesbury, last seen in the Bristol region nearly a century ago, the **Bithynian Vetch** near Paulton, **Whorled Clary** at Marshfield and the scarce hybrid **Bulrush** found at a second site in North Somerset. The presence of a single plant of **Rock Samphire** at New Passage is a welcome appearance in a site where it was last seen in 1922 and where hopefully it may re-colonise. The import of a very substantial amount of sand for an amenity arena in Bristol Castle has led to the presence of a number of less common plants and notably the abundance there of **Small Cudweed**, a considerable rarity in the Bristol area.

The publication in 2002 of the New Atlas of the British and Irish Flora edited by C.D. Preston, D.A. Pearman and T.D. Dines is a substantial achievement, being a very important reference work, which provides a wealth of information about the present and past distribution of both native and alien plants. An unfortunate slip here is to relate the 1991 record of *Orchis purpurea* **Lady Orchid** for Leigh Woods to W. Gloucestershire rather than to N. Somerset.

In the revived Ecology in Somerset section of Somerset Archaeology and Natural History, Vol. 145 for 2001 (published 2003), there is a paper entitled The History of Sharpham Moor Plot by Graham M. Rix, pp. 195-199. This plot, believed to be the second oldest in Britain purchased as a Nature Reserve, and the site of the first British record of the hybrid sedge x *Carex evoluta*, has a substantial range of peat moor plants and is a Site of Special Scientific Interest.

An obituary of Dr Elizabeth W. Woodward (née Davies), who died on 18 February 2002, is given in Watsonia, 2003, Vol. 24, pp. 461-462. She is perhaps best known botanically for her work on the *Carex flava agg.*, in which she described *Carex scandinavica* E. W. Davies new to the British Isles (this sedge is now called *Carex viridula ssp. viridula var. pulchella*). She collaborated in an account (A.J. Willis and E.W. Davies, Watsonia, 1960, Vol. 4, pp. 211-217) of the **Somerset Rush** *Juncus subulatus* described new to Britain on its discovery in the saltmarsh at Berrow in 1957. A keen and experienced equestrian, she was

most unfortunately confined to a wheel-chair since 1968 when her horse fell on her.

Names of contributors of plant records are abbreviated thus:

RLB	R.L. Bland	PM	Pam Millman
PJC	P.J. Chadwick	PJMN	P.J.M.Nethercott
RSC	R.S. Cropper	EGMN	E.G.M.Niblett
IPG	I.P. Green	PQ	P.Quinn
CK	Clare Kitchen	MJT	M.J.Trotman
MARK	M.A.R. Kitchen	BGW	Barbara Wanford
JM	J. Maxwell		

The area covered by this report is essentially that defined by J.W. White for his Flora of Bristol (1912). The eastern boundary is taken as the old boundary of Wiltshire where it meets the old boundaries of both Gloucestershire and Somerset. The southern limit is taken as approximately the course of the River Brue along some of its length. The area comprises the northern part of the Watsonian vice-county of North Somerset (v.c.6) and the southern part of West Gloucestershire (v.c.34). In the following records these parts are designated S and G respectively.

Plant names are in accordance with C. Stace New Flora of the British Isles, 2nd edition, 1997.

Ranunculus ophioglossifolius Vill. **Adder's-tongue Spearwort.** Flowering on Inglestone Common, G, MARK & CK, and also later MJT.

R. trichophyllus Chaix **Thread-leaved Water-crowfoot.** Burnham-on-Sea, S, RSC.

R. aquatilis L. **Common Water-crowfoot.** New pond on saltings, just north of Avonmouth; also *R. sceleratus* L. (**Celery-leaved Buttercup**) in ditch nearby, G, RLB.

R. penicillatus (Dumort.) Bab. **Stream Water-crowfoot.** In River Frome, near city centre, Bristol, G, RLB.

Papaver hybridum L. **Rough Poppy.** Several in arable field, Hawkesbury, G, PQ. This poppy has not been recorded in the Bristol region since 1926, when it was noted as a garden weed at Sand Bay, Kewstoke, S (see Bristol Botany in 1926, p. 314).

Meconopsis cambrica (L.) Vig. **Welsh Poppy.** Clay Hill, Bristol, G, RLB.

Chelidonium majus L. **Greater Celandine.** Growing well in roadgrit box, near Cotham, Bristol, G, RLB.

Fumaria officinalis L. **Common Fumitory.** Waste ground, Cribbs Causeway, Bristol, G, and also Bedminster, Bristol, S, RLB.

Diplotaxus tenuifolia (L.) DC. **Perennial Wall-rocket.** One plant in 2001 in shrub-bed, High Street, Nailsea, S; spreading since first noted in 2000 in road verge at A38 junction with Barrow Gurney road, S, PM.

Barbarea vulgaris W.T. Aiton **Winter-cress.** River Avon bank, Bristol, G, RLB.

Viola reichenbachiana Jord. ex Boreau **Early Dog-violet.** An example of persistence (as also of a number of other species) over many years of a colony in a patch about 15 metres long of undisturbed raised ground, Sneyd Park, Bristol, G, PJMN.

Cerastium diffusum Pers. **Sea Mouse-ear.** Several plants in sandy substrate between paviours in car park, Bramley Close, Kingswood, G, MJT.

Spergularia rubra (L.) J. & C. Presl **Sand Spurrey.** Abundant on introduced sandy area of amenity arena, Bristol Castle, Bristol, G, MARK & CK. Seen on Botanical Section meeting and known here by MARK for some years. Also on this sandy area three large plants of *S. marina (*L.) Griseb. **(Lesser Sea-spurrey**), MARK & CK.

S. media (L.) C. Presl **Greater Sea-spurrey.** In the stone wall joints of vertical walls of the New Cut, Clifton Wood eastwards in three one-km squares, where daily swept by the saline tide, Bristol, G, RLB. There is a distinct succession of plants in the joints.

Malva sylvestris L. **Common Mallow.** Waste ground, Cribbs Causeway, Bristol, G, RLB.

M. neglecta Wallr. **Dwarf Mallow.** A small patch of flowering plants by road to sewage works, West Huntspill, S, RSC.

Althaea officinalis L. **Marsh-mallow.** Two fairly small flowering plants, top of saltmarsh, Sand Bay, S, RSC. A recent arrival at this site.

Geranium pratense L. **Meadow Crane's-bill.** Barton Hill, Bristol, G, and Arno's Vale, Bristol, S, RLB.

G. pusillum L. **Small-flowered Crane's-bill.** A small patch in flower and fruit on grassy bank on shore, Severn Beach, G, RSC.

G. robertianum L. **Herb-Robert.** Several white-flowered plants with normal ones, footpath, Sandford Hill, S, RSC.

Erodium maritimum (L.) L'Hér. **Sea Stork's-bill.** Plentiful in pavement cracks and gutter of urban cul-de-sac, Clifton Wood, by Ambra Vale, Bristol, G, RLB, conf. Tony Smith.

E. cicutarium (L.) L'Hér. **Common Stork's-bill.** On footpath, Alveston, G, JM.

Lotus glaber Mill. **Narrow-leaved Bird's-foot-trefoil.** One very fine plant on shingle beach, Severn Beach, G, RSC.

Onobrychis viciifolia Scop. **Sainfoin.** Five plants, Southmead Hospital, Bristol, G, Jonathan King.

Vicia bithynica (L.) **Bithynian Vetch.** Three sites for this scarce plant are now known in the Cam Valley Wildlife Group area. It has long been

recorded in good quantity on south-facing railway banks at Radstock, S, and on banks of the railway cutting at Kilmersdon, S. In June 2000 a few plants were found by J. Neaves on a south-facing hedge-bank just outside Paulton, S, where it has persisted for three years, Helena Crouch.

Lathyrus nissolia L. **Grass Vetchling.** Many plants in shrubbery, The Mall, Cribbs Causeway, Bristol, G, BGW.

Aphanes australis Rydb. **Slender Parsley-piert.** In good quantity on introduced sandy area of an amenity arena, Bristol Castle, Bristol, G, MARK & CK. Also here several plants of *Chaenorhinum minus* (L.) Lange (**Small Toadflax**), MARK & CK. Both species seen on BNS Botanical Section meeting.

Rosa tomentosa Sm. **Harsh Downy-rose.** Flowering in roadside hedge, Wotton-under-Edge, G, RSC.

R. rubiginosa L. **Sweet-briar.** One large flowering bush in hedgerow, near boatyard, Uphill, S, RSC.

R. micrantha Borrer ex Sm. **Small-flowered Sweet-briar.** Single bush on lower rock face, Great Quarry, Avon Gorge, G, RSC.

Lythrum salicaria L. **Purple-loosestrife.** By River Frome, near City centre, Bristol, G, RLB. Also with *Filipendula ulmaria* (L.) Maxim. (**Meadow-sweet**), *Iris pseudacorus* L. (**Yellow Iris**) and *Pulicaria dysenterica* (L.) Bernh. (**Common Fleabane**) in new pond, The Mall, Cribbs Causeway, Bristol, G, RLB.

Eryngium maritimum L. **Sea-holly.** Although given in The Flora of the Bristol Region, ed. I.P. Green et al. (2000) as last recorded in the Bristol region in 1971, a single plant was noted at Uphill, S, RSC, in July 1975 and was also seen there in July 1983, the final record, RSC.

Sison amomum L. **Stone Parsley.** A large patch on waste ground, Cribbs Causeway, Bristol, G, RLB.

Berula erecta (Huds.) Coville. **Lesser Water-parsnip.** Scattered over several square metres in dried-up ditch, Blisham Farm Gate, Northwick, Pilning, G, BGW.

Crithmum maritimum L. **Rock Samphire.** A single plant growing amongst Carboniferous Limestone blocks of sea-wall, New Passage, G, MARK & CK. This was last recorded here by E.M. Day (1910) and J.W. White (1922) and is one of only three extant sites for the plant in v.c. 34. Seen with BNS Botanical Section.

Polygonum arenastrum Boreau. **Equal-leaved Knotgrass.** Common along coastal path, west of Portishead, S, PM.

Pyrola rotundifolia L. *ssp. rotundifolia* **Round-leaved Wintergreen.** A good size patch in old limestone quarry in Ham Woods, near Croscombe, S, Ann Cole. Specimen in Herb. IPG. This is a first record for Somerset.

Primula veris L. **Cowslip.** A very large number flowering along bank of M4 slip road, Tormarton; two other colonies with more than a hundred flowers near Tormarton; also at Cadwell Hill, West Littleton; Tracy Park, Wick; and near Marshfield, all G, PJC.

P. ×polyantha Mill. *(P. vulgaris* Huds. *×P. veris* L.*)* **False Oxlip.** Near edge of plantation, Alveston, G, JM.

Lysimachia vulgaris L. **Yellow Loosestrife.** A large clump in open area adjoining Weston Big Wood, S, EGMN.

Samolus valerandi L. **Brookweed.** Several flowering plants along overgrown rhine, Tealham Moor, S, RSC.

Myosotis discolor Pers. **Changing Forget-me-not.** In good quantity, damp meadow, Chilton Moor, S, RSC.

Lithospermum officinale L. **Common Gromwell.** A few flowering plants, field adjoining Cheddar Wood, S, RSC.

Verbascum nigrum L. **Dark Mullein.** Between paving stone and wall, Nailsea Library, S, PM.

Linaria repens (L.) Mill. **Pale Toadflax.** Flowering in some quantity on line at railway station, Severn Beach, G, RSC.

Chaenorhinum minus (L.) Lange. **Small Toadflax.** In pavement crack, Ashton Vale, Bristol, S, RLB. This was the only site in which it was found in a survey of 75 one-km squares in Bristol, RLB.

Orobanche minor Sm. **Common Broomrape.** A plant 60 cm tall, apparently on *Medicago arabica* (L.) Huds. (**Spotted Medick**), on wasteland adjoining Norton's Wood, Clevedon, S, EGMN.

O. hederae Duby **Ivy Broomrape.** Seen in small quantity on BNS Botanical Section meeting, Bristol Castle, Bristol, G, MARK & CK.

Calamintha acinos (L.) Kuntze. **Basil Thyme.** Persistent, where first found in 1991, in old quarry, Compton Martin, S, RSC.

Plantago coronopus L. **Buck's-horn Plantain.** On introduced sandy area of amenity arena, Bristol Castle, Bristol, G, MARK & CK. Also good quantity of *Rumex acetosella* L. (**Sheep's Sorrel**), MARK & CK. Both seen on BNS Botanical Section meeting and known to MARK for some years.

Campanula latifolia L. **Giant Bellflower.** Over thirty plants, one in flower and several in bud in late June, in still thriving colony on the banks of the River Frome, Bromley Heath, G, MJT.

Galium parisiense L. **Wall Bedstraw.** In 1999, on gravel path, garden of 'Beryl', Wells, S, BGW, det. IPG. Specimen in Herb. IPG. This is the first confirmed record of this rare casual in v.c. 6.

Sambucus ebulus L. **Dwarf Elder.** A fine flowering stand on hedgebank, extending into field, Banwell, S, RSC.

Adoxa moschatellina L. **Moschatel.** Hundred of plants along bank of the River Frome, Bromley Heath, G; also one small and two larger colonies, Winterbourne Down, G, MJT.

Bidens cernua L. **Nodding Bur-marigold.** One plant flowering and fruiting on strandline, Berrow, S, RSC.

Senecio sylvaticus L. **Heath Groundsel.** Street Heath, S, RSC.

Filago minima (Sm.) Pers. **Small Cudweed.** Abundant on introduced sandy area of amenity arena, Bristol Castle, Bristol, G, MARK & CK, conf. T.C.G. Rich. Seen on Botanical Section meeting.

Cichorium intybus L. **Chicory.** In hedge, Henbury, G, RLB.

Ornithogalum angustifolium Boreau. **Star-of-Bethlehem.** In two sites in grass verge, Upper Wraxall to North Wraxall road, G; also Ayford Lane, Marshfield, G, PJC.

Colchicum autumnale L. **Meadow Saffron.** Seventeen flowers under sycamore, Chew Valley Lake, S, and thirteen in rough grass of field, Stowey Bottom, Chew Valley, S, David Warden.

Paris quadrifolia L. **Herb-Paris.** Persistent in Prior's Wood, near Clapton-in Gordano, S, EGMN.

Ophrys apifera Huds. **Bee Orchid.** A large colony (49 spikes) on land adjoining Easton-in-Gordano Bypass, St George's side, S, EGMN.

Orchis morio L. **Green-winged Orchid.** One good flower spike, Berrow dunes, S, RSC. This is a first record for these dunes.

Dactylorhiza fuchsii (Druce) Soó **Common Spotted-orchid.** One white-flowered spike among many normal coloured, Leigh Woods, Bristol, S, RSC.

D. praetermissa (Druce) Soó **Southern Marsh-orchid.** Norton's Wood, Clevedon; also adjoining Easton-in-Gordano By-Pass, with *D. fuchsii* and possible hybrids, S, EGMN.

Typha latifolia L. **Bulrush.** With *Carex pendula* Huds. (**Pendulous Sedge**) in new pond, The Mall, Cribbs Causeway, Bristol, G, RLB.

T. ×*glauca* Godr. (*T. angustifolia* L. × *T. latifolia* L.) In rhyne on south side of Claverham Drove, north of Yatton, S, IPG. This is a second record for v.c. 6.

Vulpia myuros (L.) C.C. Gmel. **Rat's-tail Fescue.** About twenty flowering spikes on side of dry track in Frome Valley, Bromley Heath, G, MJT. In good quantity, old railway sidings, Radstock, S, RSC.

Puccinellia distans (Jacq.) Parl. **Reflexed Saltmarsh-grass.** New Passage, G, RSC.

P. rupestris (With.) Fernald & Weath. **Stiff Saltmarsh-grass.** On dried mud patch on path through saltmarsh alongside River Avon, below Old Sneyd Park, Bristol, G, MARK & CK.

Parapholis incurva (L.) C.E. Hubb. **Curved Hard-grass.** A good patch in flower on mobile dunes, Berrow, S, RSC, also IPG. Not reported from this area for many years.

ALIENS

Papaver somniferum L. **Opium Poppy.** Near Chittening Warth, G, RLB.

Eschscholzia californica Cham. **Californian Poppy.** Flowering in soil around tree, Sea Mills, G, RLB.

Hesperis matronalis L. **Dame's-violet.** Bank of River Avon, Bristol, G, RLB.

Saponaria officinalis L. **Soapwort.** Portway, Bristol, G, RLB. Many plants in 30 metre stretch of hedge and verge, Winford, S, PM.

Impatiens glandulifera Royle. **Indian Balsam.** Bank of River Frome, near City centre, Bristol, G, RLB.

Aesculus hippocastanum L. **Horse-chestnut.** For the last three years the Grey Squirrel (*Sciurus carolinensis*) has seriously damaged these trees in gardens in Sneyd Park, Bristol, G, PJMN. This apparently recently acquired habit leads to the destruction of the flowering shoots before they open and they do not regenerate. The Grey Squirrel is also responsible in Sneyd Park, as elsewhere, for stripping bark from young trees of **Sycamore** (*Acer pseudoplatanus L.*) leading to their death, PJMN.

Parthenocissus quinquefolia (L.) Planch. **Virginia-creeper.** Top of Clarken Combe, where no dwellings close, north of Long Ashton, S, RLB.

Medicago sativa L. *ssp. sativa* **Lucerne.** About twenty plants, near coast path west of Portishead, S, PM.

Melilotus officinalis (L.) Pall. **Ribbed Melilot.** Bank of the River Avon, near the City centre, G, RLB.

Trifolium hybridum L. **Alsike Clover.** Scattered plentifully along disturbed ground on north bank of Huntspill River, West Huntspill, S, RSC.

Lathyrus latifolius L. **Broad-leaved Everlasting-pea.** Embankment of M32, near Frenchay, G; also Portway, Bristol, G, and near Chittening Warth, G, RLB.

Pyrus pyraster (L.) Burgsd. **Wild Pear.** In old hedge, north-east of Avonmouth, G, RLB.

Heracleum mantegazzianum Sommier and Levier **Giant Hogweed.** Bank of River Frome, near City centre, Bristol, G; also roadside, North Wick, near Dundry, S, RLB.

Cyclamen hederifolium Aiton **Sowbread.** Durdham and Clifton Down and Mariners path, Stoke Bishop, Bristol, G, RLB. One clump in trimmed road verge, west of Moat House Farm, towards Clapton-in-Gordano, S, PM.

Lysimachia punctata L. **Dotted Loosestrife.** A strong colony, waste ground, Severn Beach, G, and also a small colony on railway track, Sea Mills, G, PJMN.

Lycium barbarum L. **Duke of Argyll's Teaplant.** West of St George, Bristol, G, RLB.

Salvia verticillata L. **Whorled Clary.** A large clump (12 × 2 metres) of more than a hundred plants on border of track and field, Northfield Lane, Marshfield, G, PQ (conf. MARK & CK). This plant does not appear to have been recorded in the Bristol region since 1967.

Leycesteria formosa Wall. **Himalayan Honeysuckle.** Stoke Bishop and Clifton, Bristol, G, RLB.

Ambrosia artemisiifolia L. **Ragweed.** Three plants in flowerbed, garden, Tickenham Hill, S, Keith Giles.

Solidago canadensis L. **Canadian Goldenrod.** Roadside, Dyrham, G, RLB.

Cicerbita macrophylla (Willd.) Wallr. **Common Blue-sow-thistle.** A small flowering patch on dumped soil on Portway, Clifton, Bristol, G, RSC.

Pilosella aurantiaca (L.) F.W. Schultz & Sch. Bip. *(Hieracium aurantiacum L.)* **Fox-and-Cubs.** Dotted about in grass, Sanctuary Gardens, Sneyd Park, Bristol, G, BGW.

Acorus calamus L. **Sweet-flag.** A good patch, River Avon, below Bristol Castle, Bristol, G, MARK & CK. Seen on BNS Botanical Section meeting. This find represents a westerly extension along the Avon, being previously recorded at the western end of the Feeder Canal.

Cortaderia richardii (Endl.) Zotov **Early Pampas-grass.** Self-sown at base of wall, Wells, S, IPG. This is a first record for v.c. 6.

Bromopsis inermis (Leyss.) Holub. **Hungarian Brome.** Well established on roadside bank, B4461, Aust, G, MARK & CK, det. T.C.G. Rich.

Polypogon monspeliensis (L.) Desf. **Annual Beard-grass.** Bank of River Avon, Bristol, G, and old rail track adjoining River Avon, G, RLB, det. A.G. Smith.

P. viridis (Gouan) Breistr. **Water Bent.** Abundant along towpath, St Philip's Bridge, opposite the former Georges Brewery, G, MARK & CK. Seen on BNS Botanical Section meeting. Reported last year by the Cornubia public house (Bristol Botany in 2001, p. 87) and is probably more widespread in this area.

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Bristol Mammal Report 2002

Mary J. Trump and David P. C. Trump

This is the thirteenth recent mammal report for Bristol and its surrounding districts. Its intention is to be a wide-ranging review of the records and studies of mammals in and around the Bristol area and to report on significant issues and events affecting British mammals in 2002. The number of one-kilometre squares in which those species were recorded is given in brackets after the scientific name, followed by the number of one kilometre squares for 2001 and 2000. The former county of Avon covers an area of approximately 1300 square kilometres, and so the number of 1 km squares for which records have been received gives an indication of the abundance of each species. All grid references are for the 100 km grid square ST. The differences between the years is likely to be due to changes in numbers and locations of recorders rather than changes in mammal abundance or distribution.
Highlights include the finding of a possible **Natterer's Bat** nursery colony and the continued spread of **Otters** back into the area.

Reports On Mammals

INSECTIVORA (hedgehogs, shrews, and moles)

Hedgehog *Erinaceus europaeus* (45 squares in 2002, 38 in 2001, 97 in 2000)
There were 47 road casualty records from 41 1-km squares:- 4070, 4170, 4364, 4871, 5165, 5169, 5271, 5484, 5585(2), 5669, 5679, 5770, 5776, 5777 (4), 5778, 5780, 5869, 5874, 5876, 5879, 5976, 5988, 6069, 6081, 6086(3), 6159, 6186, 6257, 6275, 6388, 6476, 6480, 6690, 6754, 6784, 6888, 6893, 7083, 7092, 7164, 7866.
[Records from: RB, AMB, PC, AJM, JCR, BT, MT, DT]

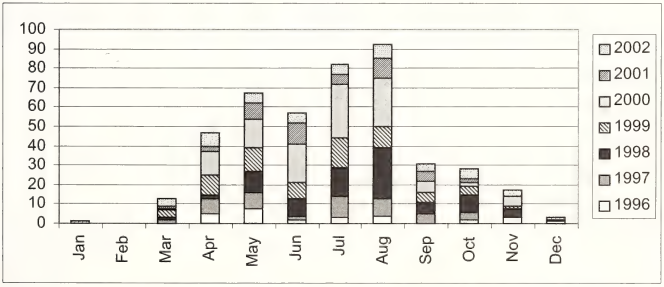

Figure 1. Number of Hedgehog Road Casualty Records per Month 1996-2002

Seven years of data and 438 records of road casualty Hedgehogs show two main peaks (Figure 1): in May when most Hedgehogs have emerged from hibernation and in July/August when the young of the year disperse. Hedgehog road casualties have now been recorded in every month of the year except February.

Other hedgehog records/sightings/observations: -

Joan Marsh recorded two Hedgehogs in her garden in Ashton in November, a fully grown adult and a juvenile feeding on bird food (5771).

John Martin reports a juvenile found asleep in his bin store in Pilning (5584) in the early autumn. It had departed by the following day.

Richard Bland reports two dead Hedgehogs in Bedminster Down (5769) and Henleaze (5775).

Mr J C Rawlinson reported a Hedgehog crossing a road in Pilning (5585) in August. He also reported from his Pilning garden (5585): droppings seen near feeding station from 3 April; first sighting of a Hedgehog (feeding on peanuts) on 19 April; two individuals seen feeding regularly between 27 April and 24 May; one to two individuals seen emerging from his garage between 12 and 20 June; 3 July – one feeding on lawn with 7 Foxes! One adult seen almost every night during August with two young; 20 October – tiny (undersized) Hedgehog seen in the garage, fed and watered with peanuts and cat food for almost three weeks; 1 November – second tiny Hedgehog seen; 14 November – one seen using garage; 19 November – last evidence in garage, ceased feeding.

Mole *Talpa europea* (63, 69,151)
Records of Mole hills from the following 1-km squares: 4372, 4373, 4569 (2), 4571, 4671, 4875, 4876, 4970, 5269, 5281(2), 5374, 5377(2), 5382, 5470, 5477(2), 5478, 5570, 5571, 5577, 5585, 5669, 5670, 5678, 6075(3), 6076, 6176(3), 6186, 6187, 6276(3), 6277, 6278, 6371, 6372, 6376(2), 6377, 6382, 6388, 6477, 6479, 6690, 6883, 6983, 7170, 7172, 7374, 7375, 7403, 7475, 7476, 7576(3), 7675, 7677(3), 7771, 7776(2), 7777(2), 7784, 7876, 7878 (2), 7975, 7976, 8074, 8075(2). The only other record was a Mole found dead on a road (4569)
[Records from: RB, PC, JCR, MT, DT]

Common Shrew *Sorex araneus* (4,3,1)
Two were unfortunately found drowned in a bucket in August (5585) and another killed by a cat, also in August; 2 in Longworth traps at Clapton Moor (4573); 5 in Longworth traps at Clapton Moor (4673); 5 in Longworth traps at

Royal Portbury Dock (5876). ([See sections on small mammals at Royal Portbury Dock and Clapton Moor Nature Reserve].
[Records from: SE, JCR, DT]

Pygmy Shrew *Sorex minutus* (4,0,0)
One found in a nest box on Walton Moor (4474) in February; 3 in Longworth traps at Clapton Moor (4573); 2 in Longworth traps at Clapton Moor (4673); 2 in Longworth traps at Royal Portbury Dock (5876). [See sections on small mammals at Royal Portbury Dock and Clapton Moor Nature Reserve].
[Record from SE, LR, DT]

Water Shrew *Neomys fodiens* (2,0,0)
One record of a dead Water Shrew at Chew Valley Lake (5758) in June; 4 in Longworth traps at Royal Portbury Dock (5876). [See sections on small mammals at Royal Portbury Dock and Clapton Moor Nature Reserve].
[Records from SE, DW]

Studies of Water Shrews using baited tubes in the south east of England. The dung was then studied for identification purposes. It was found that habitats included rivers, streams, canals and ditches. There was no evidence to show human disturbance had a detrimental affect on their populations but they were absent from river catchments with poor water quality. Fast flowing shallow waters were favoured whereas low herbaceous vegetation and riverbanks with low inclines were avoided. (Wildlife Reports, British Wildlife 13 (6): 427-8.)

Shrews and Habitat Fragmentation
A study of shrews living on a golf course in Yorkshire has shown that during a year's trapping only 8% of Common Shrews moved across fairways while 37% of Pygmy Shrews did move between patches of rough. This showed them to be similar to other small mammals such as the Common Dormouse and the Short-tailed Field Vole which have also been shown to be sensitive to habitat fragmentation. (Wildlife Reports, British Wildlife 13 (3): 199)

CHIROPTERA (Bats)

Greater Horseshoe Bat *Rhinolophus ferrumequinum* (1,0,1)
140 were recorded at Brockley (4766) on 26 July (ABG).

It was reported in the local press that surveys were being carried out on the late Lord Wraxall's property, Tyntesfield, for Greater Horseshoe Bats. Surveyors have already discovered Lesser Horseshoe and Long-eared Bats on the estate and they think the habitat is good for Greater Horseshoes too. (Bristol Evening Post 28 June 2002).

Lesser Horseshoe Bat *Rhinolophus hipposideros* (9,0,3)
One seen at Abbots Pool (5373) on 18 July; two at Keynsham bat cave (6470) on 9 February; four recorded at Dolebury Warren (4558) on 25 January; thirty eight were seen at Blackdown (4758) on 25 January; one recorded at Rowberrow Common (4558) on 25 January; six were recorded at Chew Stoke (5561) on 18 August; 128 at Upper Langford (4559) on 3 June; more than 20 at Blagdon (5059) on 8 September; 15 at Pensford (6162) on 15 December.
[Records from ABG, DT MT].

Whiskered Bat *Myotis mystacinus* (1,0,0)
At least six recorded at Chew ton Keynsham (6565) on 25 July (ABG).

Natterer's Bat *Myotis nattier* (3,1,3)
One was seen on 10 July emerging from the roost at Burnett (6665). Usually 30+ are seen at this location but this particular night was very cold so the bats stayed in their roost. This roost is part of an ongoing study being made by Bob Howard.

A dead bat found in the garden of a house in West End, Nailsea (4569) on 25 July was later identified as a juvenile Natterer's Bat (confirmed by Katie Parsons and Gareth Jones of Bristol University). It may be only the second location known in Avon as a summer roost for Natterer's bats. Further studies are likely to be carried out at this location in 2003.

One was recorded at Rowberrow Common (4558) on 25 January.
[Records from ABG, DT & MT]

Bechsteins Bat *Myotis bechsteinii* (1,0,0)
Two found in bat boxes at Folly Farm (6060).
[Record from JR]

Daubenton's Bat *Myotis daubentoni* (2,1,0)
Several seen flying low over the water at Abbot's Pool (5373) on 18 July. Six+ seen at Eastville Park Lake (6175) on 24 August.
[Records from ABG, DT & MT].

Serotine *Eptesicus serotinus* (2,0,0)
At least five recorded at Nordrach (5156) on 25 June. One was recorded at Burnett (6665) on 24 August.
[Records from ABG]

Noctule *Nyctalus noctula* (4,3,1)
Two seen at Abbots Pool on 18 July (5373), at least two seen at Brockley on 13 July (4866). One male found in a bat box at Folly Farm (6060). There were two records of a Noctule flying in Montpelier (5974) including one seen flying in bright sunshine at 13.30 hrs on 24 December.
[Records from DB, JR, DT & MT]

Leisler's Bat *Nyctalus leisleri* (0, 1,0)
No records for this year.

Common Pipistrelle *Pipistrellus pipistrellus* and **Soprano Pipistrelle** *Pipistrellus pygmaeus* (12,4+, 3)
Several pipistrelles were seen at Abbots Pool on 18 July (5373), at Brockley on 13 July (4866) and at Burnett on 10 July (6665). At least two were recorded in a garden in Yatton (4364) on 25 August. Approximately 20 bats had been counted out of the roof a few nights earlier, although the species is not confirmed. There were also regular sightings of pipistrelles in a garden in Pilning (5585) between 16 May and 30 September. A late sighting was made on 30 October in Henleaze (5776).

Avon Bat Group recorded pipistrelles at the following locations: three at Folly Wood, Bishop Sutton (6060) on 27 January; one at Stowey (5959) on 28 June; sixty one at Ham Lane, Dundry (5567) on 2 June; 120 at Upper Weston, Bath (7267) on 9 June; more than 100 at Towerhouse Lane, Wraxall (4772) on 24 June; more than 955 were recorded at Blind Lane, Chew Stoke (5662) on 18 July.
[Records from ABG, JCR, DT, MT]

Nathusius' *Pipistrelle Pipistrellus nathusii* (0, 1,0)
No records this year but still thought to be present in the Blagdon and Chew Valley areas.

Brown Long-Eared Bat *Plecotus auritus* (1,0,0)
More than three recorded at Wraxall (4972) on 30 July.
[Record from ABG]

Bat Studies at Bristol University

Professor Gareth Jones launched the Mammal Society's Easter Conference with a lecture on the recent research into Greater Horseshoe Bats. Studies of the species have included the use of bat detectors, very small transmitters and aerial tracking from light aircraft. The research group found the Greater Horseshoe

Bats use ancient semi-natural woodland and cattle-grazed pasture where key food items such as the dung beetle can be found. The mean foraging range was 2.23 km. 75% of the feeding areas lay within this radius for adults whereas juveniles remained within 1.5 km of the roost until they were at least 50 days old.

Studies have also identified swarming behaviour among bats. In autumn thousands of bats, mainly males, appear at some hibernation sites after feeding. The species displaying this behaviour were mainly Natterer's and Daubenton's Bats. Some bats were travelling to these swarming sites from a great distance, which suggests that these swarming roosts could be important areas for outbreeding.

Dr Carol Williams also reported on her research into Lesser Horseshoe Bats. She found that this species fed throughout the winter, depending on the temperature. They used grazed areas and damp woodland and fed selectively on dung-flies. They were tracked to a distance of 2.1 km with an average foraging distance of 1.2 km. (Wildlife Reports, British Wildlife 13 (5): 351.)

LAGOMORPHA (Rabbits and Hares)

Brown Hare *Lepus europaeus* (10, 11,34)
Records from the following 1-km squares: two seen in new area of salt marsh on 11 December on the Axe Estuary (3157), John Martin reports that Brown Hares used to be seen regularly in this location in the past; two seen in a field at Little River near Yatton (4066); one seen on Puxton Moor (4163); one seen on Clapton Moor (4573); one seen in a field at Stowey (5959); one seen in a field at Burnett (6665); one seen at Doynton (7374); one in a mixed arable area (7577); one seen on a road at Marshfield (7774); three seen at Marshfield (7974).
[Records from: DB, PC, JPM, BT, DT, DW]

Questionnaires were sent out by researchers at Bristol University to farmers to investigate why Hares are common in arable habitats but rare in pastoral and other habitats. Brown Hares were described as declining on 42% of farms and increasing on 22% of mainly arable farms. Hares were more likely to be seen on farms with wheat, beet or fallow land. Wheat and beet provide food and the fallow areas provide cover. Pastoral farmers reported more sightings of Hares if they had woodland or mainly improved grassland.

There was little relationship between the numbers of Rabbits and Hares on farms. However, there were fewer Hares where Foxes were present as they are the major predators of Hares, especially leverets. The relationship between Hare numbers, habitat and predation was difficult to determine from the questionnaire

but it was shown that higher numbers of Hares were recorded in larger fields with cover such as woodland and fallow. This habitat probably results in less predation. (Wildlife Reports, British Wildlife 14 (1): 46-47.)

Rabbit *Oryctolagus cuniculus* (36,19,105)
Records from the following 1-km squares: 4469 five in field; 4569 (2 records) two seen in the hedgerow in April and 5+ seen in the field in June; 4871, 5281(2), 5378 3 seen on two occasions, 5379 (2 records), 5380 9 seen, 5382(2), 5383, 5467 one seen at Barrow Common, 5478, 5479 8 seen, 5480 2 seen, 5483, 5484(2), 5485, 5579(2), 5584, 5585, 5669, 5679, 5687, 5769, several seen at 5770 on the central reservation of the main road, 5781, 5880, 5881, 5988, 6075(2), 6176(2), 6270, 6371, 6388, 6386, 6585, 6883. It is interesting to note that no myxomatosis was recorded this year.

J C Rawlinson reports one or two adults seen regularly between 1 March and 30 August in his garden (5585). A juvenile was seen feeding on clover on 3 June. Three or four individuals were seen up to 19 November. Droppings were recorded most days near bird feeding stations.
[Records from: JM, JCR, DT]

RODENTIA (rats, mice, voles and squirrels)

Brown Rat *Rattus norvegicus* (13,6+,17)
One record of up to 12 rats seen in a garden (4569) feeding on bird food; one seen dead at Ham Green (5376), 5556; several records from a rural garden in Pilning (5585) in May – up to 2 adults and 5 juveniles – one was seen climbing along a wire between two trees to reach a bird feeder; one seen on the tidal area of the River Avon (5972) and one seen in St Weburghs (5974); other records from 5770, 6169, 6170, 6485, 6891, 7288, 7692.

The Bristol Evening Post reported that there was a rise in the number of rats due to the increase in fast food outlets and litter on the streets. Diane Shakespeare of Keep Britain Tidy stated that the amount of rubbish on our streets has risen by 80% since the 1960s. (Bristol Evening Post 1 August 2002.)
[Records from RB, DB, JCR, MT]

Black Rat *Rattus rattus*
A discovery by Roger Symes in the old Ministry of Agriculture Fisheries and Food archives at Bristol of a map showing records of the presence of Black Rats in 1945 apparently by questionnaire survey of local authorities revealed the presence of 32 major infestations throughout England and Wales. These included 'extensive infestations' in Bristol and Gloucester. The records emphasised the largely coastal distribution of the species and its dependence on

shipping for its survival and recurrence. The authors conclude that the distribution map confirms the notion that the introduction of containerised transport of foodstuffs and their better storage was instrumental in reducing the species to near extinction in Britain (Symes and Yalden 2002).

Grey Squirrel *Sciurus carolinensis* (37,50,77)
There were records from the following 1-km squares: 4169(2), 4269, 5274, 5373(2), 5479, 5571, 5577(2), 5585 (regular sightings in a Pilning garden between 1 January 3 June), 5668, 5679, 5769, 5770, 5772, 5774, 5778(2), 5779, 5789, 5873(2), 5876 (seen regularly in a garden stealing bird food!), 5881, 5975, 6060, 6075, 6172, 6176, 6184, 6270, 6272, 6376, 6377, 6381, 6390, 6477(2), 6689, 6684, 7182.

John Burton reports up to three Grey Squirrels were seen daily (5778) between April and May with 5 being seen in June.

Richard Bland continued with his breeding bird survey in ST5673 every week. He counted 91 squirrels at a rate of 1.8 an hour, which was less than last year. Peak numbers were counted in the first two weeks of October, two weeks later than last year.

The Bristol Evening Post reported how a Clevedon Bowls player was bitten by a squirrel. This was after the person in question had tried to stroke the squirrel. (Bristol Evening Post 7 May 2002.)

More than 1500 homes in Nailsea and Backwell lost power in July due to a squirrel jumping onto overhead power lines. Power was lost for two and a half hours. (Clevedon Mercury 11 July 2002.)
[Records from: RB, JB, PC, JCR, LR, JM, DT, MT]

Water Vole *Arvicola terrestris* (2,2,0)
One seen swimming across a rhyne in the Gordano valley in March 4573; a brief glimpse of a Water Vole at 5379 on 14 May (during a walk led by Phil Quinn of the Avon Wildlife Trust).

Simon Eyre and colleagues at Bristol Zoo are involved in a Water Vole breeding and release scheme.
[Records from DB, DT].

Bank Vole *Clethrionomys glareolus* (6,1,4)
A bank vole was seen running across the road at Chelvey (4568) in June; one found dead on the road at Pilning (5585); one unfortunate was caught by a cat (5974) in Montpelier; 18 in Longworth traps at Clapton Moor (4573); 4 in

Longworth traps at Clapton Moor (4673); 16 in Longworth traps at Royal Portbury Dock (5876). [See sections on small mammals at Royal Portbury Dock and Clapton Moor Nature Reserve].
[Records from DB, SE, JCR, DT, MT]

Short-tailed Field Vole *Microtus agrestis* (7,2,2)
Five sleeping Short-tailed Field Voles were found in December in a feeder on Walton Moor (4473?); 2 in Longworth traps at Clapton Moor (4573); 6 in Longworth traps at Clapton Moor (4673); 8 in Longworth traps at Royal Portbury Dock (5876). Others seen at 5584, 5585, 6189. [See sections on small mammals at Royal Portbury Dock and Clapton Moor Nature Reserve].
[Records from SE, JCR, LR, DT].

Harvest Mouse *Micromys minutus* (0,1,0)
No records for this year.

Common Dormouse *Muscardinus avellanarius* (1,0,)
A Dormouse was seen in Brockley (4866) in September running up the trunk of a tree from a nest box (C Parsons pers comm).

The Mammal Society is marketing Dormouse Nest Tubes, developed by Pat Morris and Paul Bright. These are used as an alternative to dormouse nest boxes and are particularly useful in non-traditional dormouse habitat such as hedgerows or areas of scrub. The tubes give an indication of Dormouse activity due to the presence or absence of Dormouse nests.

Wood Mouse (Long-tailed Field Mouse) *Apodemus sylvaticus* (5,7,6)
Brian Tizard reports a family of 2 adults and 3 young resident at his house (5873) where they regularly feed from the bird seed dispenser; several records from a garden in Pilning between April and November (5585); 75 in Longworth traps at Clapton Moor (4573); 43 in Longworth traps at Clapton Moor (4673); 13 in Longworth traps at Royal Portbury Dock (5876). [See sections on small mammals at Royal Portbury Dock and Clapton Moor Nature Reserve].
[Records from SE, JCR, BT, DT]

House Mouse *Mus domesticus* (1,4,3)
Regular activity, bait takes and sightings during the year in a closed shop in Pilning (5585)[JCR].

Yellow-Necked Mouse *Apodemus flavicollis* (1,0,0)
One found in a nest box in Walton Moor in February (4463).
[Record from LR]

Small Mammal Trapping

1) Royal Portbury Dock

Simon Eyre of Bristol Zoo carried out a small mammal survey at the Royal Portbury Dock (4876, 4877, 4976, 4977) between 17 and 19 October. Six species of mammal were caught in Longworth live-capture traps and the results were as follows:

Woodmouse	13 plus 4 recaptures
Bank Vole	16 and 12 recaptures
Field Vole	8 and 2 recaptures
Water Shrew	4
Common Shrew	5
Pygmy Shrew	2

Fifty traps were used along three transects, two in grassland, one in more dense marginal foliage. 11 animals were caught in the grassland and 56 caught in the denser foliage, showing the importance of marginal vegetation. It is hoped that the trapping will be repeated in 2003.

2) Clapton Moor Nature Reserve

David Trump began a twelve month study of the small mammals of the Avon Wildlife Trust's Clapton Moor Nature Reserve (4573, 4673) in October. 120 Longworth live-capture traps were set along six field margins (10 pairs of traps at 10 metre intervals). Traps were set for three consecutive nights in each of the six field margins (Trap lines 1 and 2 were set in mature hedges with 6 metre grass margins/owl corridors – one with a ditch; trap lines 3 and 4 were set in newly planted hedges with 6 metre grass margins/owl corridors; trap lines 5 and 6 were set along ditches with associated bramble scrub with no grass margins). Trapping sessions will be undertaken every two months until August 2003. Five species of small mammal were trapped during the first two sessions (20-22 October and 14-16 December).

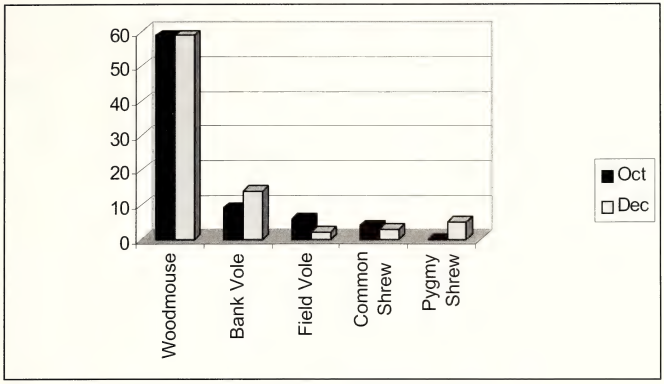

Figure 2. Small mammals at Clapton Moor Nature Reserve.

Woodmice dominate the catch with 71% in October and 76% in December. Bank Voles were the next most frequently trapped with 11% in October and 17% in December (Figure 2).

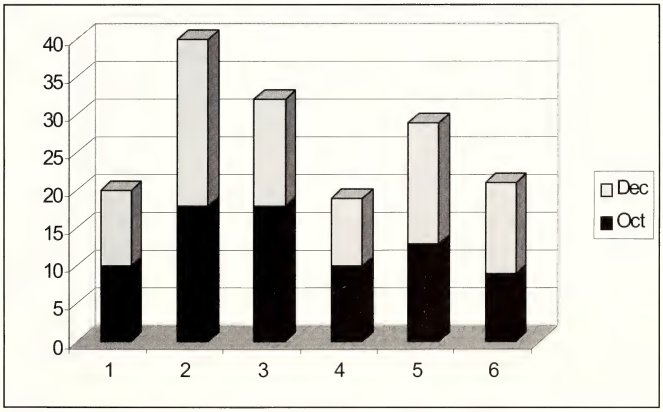

Figure 3. Total small mammal catch at each trap line.

There appear to be significant differences between capture rates in the six trap lines with, for example, trap line 2 (mature hedge/ditch/grass margin – with grass fields both sides) having twice the number of small mammals as trap line 1 (mature hedge/grass margin – next to road) (Figure.3). It is interesting to note that no Short-tailed Field Voles were caught in either trap line 1 or 2. The full results of the survey will be written up for the 2003 Mammal report and comparisons will be made with the trapping work at Royal Portbury Dock and with that undertaken in the Gordano Valley National Nature Reserve between 1994 and 1997 (Trump 1999).

The National Owl Pellet Survey

This is an ongoing survey co-ordinated by the Mammal Society and has been running since 1993. The results to the end of April 2002 show that the three main prey species were Short-tailed Field Vole, Wood Mouse and Common Shrew. These species made up 78.7% of the prey items. A further 18.5% consisted of Bank Vole, Harvest Mouse, House Mouse and Pygmy Shrew. Small mammals therefore made up 97.2% of the owls' prey with other species such as birds, reptiles and amphibians comprising the remainder. (Mammal News 131 Autumn 2002.)

CETACEA (whales, dolphins and porpoises) and PINNIPEDIA (seals)

Grey Seal *Halichoerus grypus* (1,0,0)
No 'official' records noted this year but it was reported that one or two were seen on Severnside during the year, although precise locations and dates were not recorded.
[Records from PB, RR]

CARNIVORA (carnivores)

American Mink *Mustela vison* (2,0,3)
Dick Reader reports four Mink at New Passage (5483) on 18 July. These have also been seen by Paul Bowerman who regularly visits this area. Richard Bland reports two sightings of Mink swimming across the river Avon at 6371 in May and June.

Stoat *Mustela ermina* (3,4,10)
Two were seen at Walton Moor, both in April (4475), one was seen at Stowey (6060) and one seen hunting at Marshfield (7974).
[Records from PC, LR, DW]

Weasel *Mustela nivalis* (7,3,10)
One seen at Winford on 11 August and a road kill seen the next day in the same kilometre square (5563). Could this be the same animal? Other records of a Weasel on the coast path in Walton-in-Gordano (4374) and one dead on the road at Stowey (5960). One was seen crossing the road at Marshfield (7875) and one crossing the road at Pilning (5684). A family of young Weasels were recorded on a stone wall near Chewton Mendip (5652) on 25 April. A Weasel was seen killing and feeding on a Rabbit in Harptree Woods (5554) in May.
[Records from RH, JCR, LR, BT, DW]

European Polecat *Mustela putorius* (2,2,)
One possible sighting of a Polecat near West Harptree (5657) dead on the road in October. The recorder was unable to stop because of traffic. This is an interesting record, as Polecats are known to be spreading into Avon from the north. There was another record from Pilning (5585) in May of a Polecat on the side of the road.
[Records from JCR, DW]

Otter *Lutra lutra* (25,2+,24)
Simon Reece still co-ordinates the Bristol Avon Otter Survey, although the number of surveyors have decreased this year (Reece 2003). Records for 2002 are as follows: -

River Avon – records from 6569, 6868, 7867; River Boyd – records from 6871 (a sighting in January); Corston Brook – records from 6964, 6965, 7065; Wellow Brook – records from 7357 and 7559; Cam Brook – records from 7194; River Chew – records from 5756, 5757, 5761, 5860, 5960, 5963, 6163, 6264, 6364, 6464. Apart from the River Boyd record all other records are of spraints, padding or digging.

Road traffic casualties were reported from Markham Brook (5274) on 15 February, Barrow Tanks (5367) on 27 February and the A38 (5568) on 2 November. Further afield there were road kills reported from near Chippenham (5 February) and Oakhill near the Mells Stream on 5 July. The three February kills were likely to be as a result of Otters travelling overland during periods of high river levels.

A sighting of an Otter on the Avon at Keynsham where another litter of cubs was produced and a further sighting in Bath 7264 on 19 October.

Elaine Weller writes:
"My role as the Biodiversity Officer for the North Somerset Levels and Moors Project involves the protection and enhancement of habitats and species

populations relying on the Levels and Moors environment, as well as assisting local people with wildlife projects and promoting interest about this important wildlife resource. One of the success stories in North Somerset and nationally is the return of the Otter to local water courses.

Otters became extinct in Avon in the 1960s due to heavy pollution of watercourses and habitat loss. Otters like wild, scrubby river-banks with thick grass or reeds for resting during the day, holts well hidden under tree roots or river-banks, and areas of clean, open water for fishing. These are in especially short supply where intensive agriculture and industrial, housing or road developments are a threat.

In the 1990s evidence of Otter was found on the Congresbury Yeo. In December 1999 a road kill was picked up from the bridge over the Congresbury Yeo. This activity prompted the formation of the North Somerset Otter Group (NoSOG) to survey and monitor the local population. The group now has over 30 surveyors and evidence of otter activity has been found on all major rivers and many smaller tributaries across the county. The NoSOG carry out surveys every three months during the year. Since its initial survey in Spring 2000, results have shown the presence of otters on many North Somerset watercourses. Before the Otter Group was formed there were few records of Otters in North Somerset with the only otter activity recorded in the area on the Congresbury Yeo. This area is at the northern boundary of Otter expansion from the south and so it is an extremely important area to be surveyed in the future.
The return of the Otter has been aided by a ban on organochlorine chemicals and improved water quality. Improvements have also been made to habitat with the creation of artificial Otter holts and planting of clumps of bank side trees under agri-environment schemes. There is still room for improvement and work continues to educate individuals and organisations in sensitive riparian management.".

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The North Somerset Levels and Moors Project is a Partnership between North Somerset Council, English Nature, the Environment Agency, Avon Wildlife Trust and the Bristol and Regional Environmental Records Centre.

There were regular signs of Otters on Tickenham Moor (4571, 4671) recorded during the NoSOG surveys.
[Records from SR, DT, MT]

Charlie Hamilton-James made a film about the Otters on the River Avon near to his house. He studied and filmed the otters for eighteen months and said, "This is the new face of our modern otter. It seems that garden ponds and breakers' yards are serving as replacements for the otters' more recognised habitats. It has adapted to us and is thriving." (Bristol Evening Post 21 November 2002.)

As Otters become more common across the country and increasingly inhabit urban areas, they are causing severe problems for some fishery owners. Otters have become more tolerant of humans and urban lifestyles and this has led to mixed feelings about them. Many Otters concentrate almost entirely on stocked fish in the winter, travelling from one fishing lake to another. Some owners are willing to spend money on proofing their lakes but others are not. Northumberland Wildlife Trust reports that otters are systematically fishing from garden ponds. Once woman had even bought goldfish specifically for the Otters! (BBC Wildlife December 2002.)

Badger *Meles meles* (50,42,77)
Records of road casualty Badgers from the following 1-km squares: 4170, 4271(2), 4369, 4569, 4761, 4874, 5069, 5070, 5072, 5175, 5265, 5370, 5471, 5472, 5473, 5481, 5484, 5485, 5563(2), 5570(2), 5571, 5586, 5587, 5655, 5671, 5778, 5888, 5986, 5987, 6258, 6356, 6668, 6678, 6784, 7177, 7272, 7470.
[Records from JB, PC, DD, JM, JCR, DT and MT]

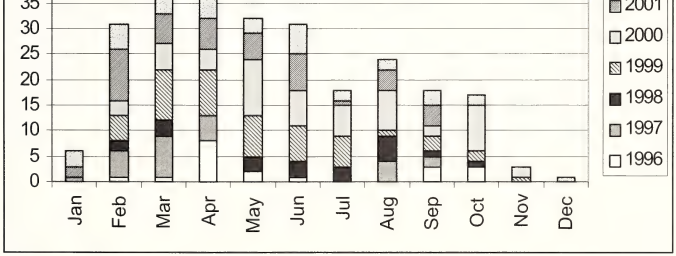

Figure 4. Number of Badger Road Casualty Records 1996-2002

Seven years of Badger road casualty figures with 259 records to date show a large peak around March/April (peak breeding season) with a smaller peak in August (dispersal of young) (Figure 4). It is interesting to note the first December road casualty badger record sent to Bristol Naturalists' was for a Badger run over in Frenchay (6678) on 12 December. There are also few records for November and January. This is the time of year when Badgers are at their least active with the pregnant females underground in their setts prior to giving birth to cubs between January and March.

Other records were of Badger setts at 4473, 5970 and 7267. Badgers were reported to be on a farm with a TB outbreak in Cromhall (6991). Lyndon Roberts and John Martin reported seeing Badgers crossing roads (5662 and 5785 respectively). There was one record of a Badger at 4673, details unknown and a record of a dead Badger at 5560. There were between one and three individuals seen regularly in a large, rural garden in Pilning (5585) between 3 June and 17 November. This includes one feeding with three Foxes from the same food tray. Two individuals were seen at Arnos Vale in May (6071). Latrines were found at 7572 and 8074 and a tuft of Badger hair was seen at 7476. David Warden reports that of the 5 subterranean wasp nests found during the summer at Chew Valley Lake, 3 were destroyed by Badgers.
[Records from DB, PC, LR, JPM, JCR, MT, DW, LW]

A research paper by David Macdonald and C Newman describes how the Badger population had increased in Wytham Woods, Oxfordshire, threefold between 1987 and 1996. The national Badger population is thought to have increased in parallel with these figures. The authors don't believe this is due to increased protection of the Badger but is due to changing weather patterns. They suggest that there is a correlation between mild winters and heavier body weights of Badgers in January. Earthworms, their staple diet, come to the surface and are more available to foraging Badgers. (Wildlife Reports, British Wildlife 13 (5): 352.)

Fox *Vulpes vulpes* (39,35,71)
Records from the following 1-km squares: 4264, 4571 (road kill), 4674, 4872 (road kill), 4970, 5069, 5070, 5072 (road kill), 5172, 5271, 5369, 5382*, 5383, 5469, 5472, 5479, 5563 (road kill), 5571*, 5584, 5585, 5657 (at least two cubs seen), 5658, 5666, 5673*, 5680, 5684, 5685, 5778*, 5770*, 5776*, 5781, 5859, 6086, 6177*, 6185, 6276, 6386, 7587, 7773.
(* = 'Bristol' Foxes)

There is an interesting series of records from a large, rural garden in Pilning (5585). J. C. Rawlinson reported evidence (droppings) of Foxes in his garden between 11 January and 8 April. The first sighting was made on 13 April, two

adults were seen on 19 April, female with a Rabbit-sized cub was recorded on 29 May and also three adults seen on this date. A female with 2 juveniles were seen feeding on 31 May; four juveniles and one adult were seen on 10 June; seven individuals were seen on 11 June; female and a cub and another adult and 3 juveniles were seen on 12 June; three adults plus five juveniles were seen on 18 June; up to six were seen daily up until 24 July; three were seen feeding with three Badgers on 23 August; two were feeding with four Badgers on 13 September; two were heard fighting in the garden on 19 November; there were regular signs of the Foxes up to 31 December.

The only Foxes recorded in 2002 within the Bristol City boundary were as follows: -
1) One seen at 5382, no details (RB).
2) One RTA in Bower Ashton (5571)(JM).
3) Fox seen hunting across the cliffs by the Suspension Bridge (5673)(RB).
4) One healthy adult seen in the evening in Westbury-on-Trym (5778)(JB).
5) A Fox seen several times (same Fox?) by a milkman in Ashton (5770)(JM).
6) Fox seen in broad daylight at Grange Road (5776)(RB).
7) One seen in September in Stoke Park (6177)(DB).

[Records from: RB, DB, JB, DM, JM, JCR, LR, AS, DT, MT, DW].

The letters section of the Bristol Evening Post in July included a correspondent from Speedwell in Bristol reporting that she saw a Fox running down the road in the early morning. (Bristol Evening Post 31 July 2002.) Following this letter, another reader replied to say that he sees what he thinks is the same Fox most days as well as a Badger family. Their main habitat is some nearby wasteground. (Bristol Evening Post 12 August 2002.)

Jackie Sharman of the RSPCA appealed for sites for the release of orphaned Fox and Badger cubs following their stay at West Hatch Wildlife Hospital near Taunton. The landowner has a pen on his or her land where the cubs are kept for a month then the doors of the pen are left open with food still being placed in the pen. The pen is removed after a further month. Ms Sharman also emphasised that the RSPCA do not take mangy town Foxes out to the countryside to release them. Adult Foxes are released in the same location they were found following treatment for mange. (Bristol Evening Post 23 November 2002.)

There has been a recent press campaign in London demanding that urban Foxes are culled. Many Foxes are born in gardens, often under sheds. The young stay in the local gardens for the next few weeks then use a larger territory. A survey by the Mammal Society and the People's Trust for Endangered Species showed that most residents enjoy (80%) or tolerate (16%) the Foxes in their gardens.

This is a dramatic increase from a survey of Bristol residents in the late 1970s that showed that only 27% of residents welcomed Foxes in their gardens. However, there are a small number of people who were willing to kill or catch Foxes for up to £200 per Fox. Newspaper articles stated that Foxes were killing pets, transmitting diseases and fouling the area. Many of the allegations made have been disproved 20 years previously by other studies. This campaign follows the cessation of a culling programme in London in the 1980s, which proved to be unsuccessful as reproduction rates rose where mortality rates were high. It is yet to be seen whether this campaign in London will continue, however it has been shown that it is far better to move the Foxes on using repellents and other methods. Studies of Bristol Foxes over the decades have shown that Bristol residents, in direct contrast to the London campaign, are now keen to see more Foxes in the area, following the dramatic drop in numbers following the mange outbreak. (BBC Wildlife May 2002.)

The Myths and Realities of Mustela

Robbie McDonald gives an insight into these secretive creatures in a paper in British Wildlife (McDonald 2002).

Many countries revere Weasels and Stoats for their dedicated parenting and fearless defence of their young but the British treat these animals with suspicion. Recent conservation concern and gamekeepers' interest in managing their populations have led to recent research into their biology and ecology.

Weasels are the world's smallest carnivores being between 50 and 200g in weight and 20-30 cm long. Stoats are larger and weigh between 120 and 500 g and are 25-45 cm in length.

Stoats have year-long delayed implantation of fertilised eggs. This has led to young female Stoats mating when they are only a few days old with a male that visits the nest to mate with their mother. They then give birth the following spring to litters of up to 13 kits. Weasels, in contrast have no delayed implantation but females are capable of breeding in their first year of life and can have two litters a year when food is plentiful. They have an average of six kits. This high reproductive output is unusual in carnivores but means that they can react rapidly to fluctuations in food supply. However, few Weasels or Stoats survive more than two years in the wild.

Weasels and Stoats are always searching for food. They are ambitious and aggressive hunters. They can kill more than they need in response to times of food shortage. Approximately two thirds of the Stoat's diet consists of Rabbits (although they weigh five times as much as a stoat), the remainder being birds

and small rodents. Weasels' diet consists of approximately two thirds of mice and voles but they also kill Rabbits, birds and other prey. Birds now make up a smaller proportion of the Stoats' and Weasels' diets since the decline of myxomatosis and the subsequent increase in Rabbit numbers.

Gamekeepers spend a great deal of time in reducing the risk of predation by Stoats and Weasels. They shoot them and use traps to kill them. Records have shown a decline in numbers of trapped Stoats and Weasels since the mid-1970's and some suggest that they may be declining in numbers. A possible reason for this is the result of secondary poisoning of stoats and weasels by rodenticides. More research is taking place into this and the uptake of bait by non-target species such as mice and voles that are then eaten by Stoats and Weasels.

Due to the fact that Stoats and Weasels are difficult to study, scientists are only now finding out more details about their ecology. Investigations are continuing into their population trends but there is a long way to go before they are as well understood as other mustelids.

ARTIODACTYLA (deer)

Red Deer *Cervus elaphus* (1,0,1)
Mr J C Rawlinson reported seeing "two deer crossing from the Imperial ground, Hengrove (6178) (from the golf course) to the derelict allotments area at 5.15 am on 25 April. One had large antlers and stood at over four feet at the shoulder. The second individual was slightly smaller with no antlers. Both moved calmly to cover. Their large size appears to rule out other species of deer".

Roe Deer *Capreolus capreolus* (27,20+,51)
Records of Roe Deer from the following 1-km squares: 4272 (2 fawns), 4373, 4374 (3 on Walton Down), 4475 (3 records), 4476, 4673, 4767, 4873, 5073, 5479, 5559, 5579, 5658, 5670(2), 5674, 6160, 6276, 6363, 6386 (2 seen at Rudgeway), 6470, 6571, 6562, 7575, 7676, 7774 (2 seen in pasture), 7863 (3 seen in a field), 7964 (2 seen in a field).
[Records from RB, DB, PC, RH, EN, SP, JCR, LR, BT, DT, MT]

Fallow Deer *Dama dama* (0,0,0)
No records for this year outside deer parks.

Chinese Muntjac Deer *Muntiacus reevesi* (1,1,0)
Bob Howard reports, "The first clear evidence near Keynsham. I have been looking for years. Very definite slot on the left bank of the River Avon near the ring road (6470) on 6 December. There was also a Roe Deer slot nearby."

Chinese Water Deer *Hydropotes inermis*
No records for this year.

EXOTICS

There was a report of a large puma-like creature near Winscombe in April. Danny Nineham who has studied these reports said he doubted whether it was a puma. He believed it could have been a panther living in the countryside. Similar large cat sightings have occurred over the last few years in Churchill and Wrington but all have proved inconclusive. (Bristol Evening Post 11 April 2002.)

A survey of the responses of the national and regional press to the existence of two populations of free-living **Wild Boar** *Sus scrofa* that became established in southern England (Dorset and Kent/Sussex) in the 1990s revealed some interesting attitudes to large mammals (Goulding and Roper 2002). They reviewed 107 articles from 46 different titles and found that the press was predominantly negative highlighting the 'danger to the public', 'damage to crops', 'predation of livestock' and 'transmission of disease'. A minority of the articles said that Wild Boar should be conserved mainly on the ground that they could be hunted for meat. There was relatively little coverage of environmental issues and what there was focussed on the detrimental effects on the native fauna and flora. They concluded that management and conservation programmes involving large allegedly dangerous mammals are likely to encounter an adverse press reaction.

Gardens And Mammals

The Importance of Gardens for Mammals

Rachel Ansell of Bristol University reported on The Garden Mammals Survey, a joint project of The Mammal Society and the People's Trust for Endangered Species which aimed to find how important garden areas are for mammals.

Gardens represent approximately 3% of the total land area of England and Wales and this figure is likely to increase in the future. They set up a survey and collected almost 20,000 mammals records in almost 4,000 gardens. The results showed a total of 43 mammal species using gardens including rarities such as the Wildcat, Pine Marten and Otter. 79% of householders recorded mice species which made them the most common mammal, closely followed by Grey Squirrel. Larger, older gardens supported a wider range of species. Food and shelter features proved to be of benefit to mammals.

The increase in wildlife friendly gardening has improved some gardens for small mammals but unfortunately this practice is not widespread. Small mammals therefore have to contend with applications of chemicals, fragmented habitats and a high density of predators. It was estimated that in one area of Bristol the density of domestic cats was approximately 160 per square kilometre. A survey of small mammals in gardens was carried out in north west Bristol. Hair tubes were used to find which species used the gardens, as this was more successful than live trapping due to theft and vandalism of traps. Five species of mammals were found – Wood Mouse, Short-tailed Field Vole, Bank Vole, shrews and Brown Rat. Wood mice were found to be the most widely distributed species although there was a low diversity of small mammals in gardens overall.

It was found that Fox and Badger presence might influence the presence of Hedgehogs, possibly as a result of predation or avoidance of these gardens by Hedgehogs.

Badgers illustrated the typical problems faced by many mammals. Although they visit gardens to feed, their setts are rare in built-up areas. Badgers therefore tended to visit gardens on the edge of built-up areas that provided easy access and food. This highlights some key problems for mammals: most are not very mobile and they are generally territorial throughout the year and so do not move around over large distances to find food.

Bats however show many of the characteristics of birds: they are more mobile than other mammals and do not defend a territory throughout the year. They still do not use gardens frequently. Radio tracking of Leisler's bats in Bristol showed that they lived in the city but foraged over farmland to the south of the city.

Surrounding habitat played an important part in determining the range of species in a garden. Surrounding woodland or farmland increased species diversity rather than being surrounded by urban habitat. Despite gardening for wildlife in an individual garden, it was shown that the surrounding habitat had a greater influence on what species used the gardens. Scattered brownfield sites within urban areas are of important conservation value and increased the diversity of species recorded in the area.
(Mammal News 129 & 131, Spring and Autumn 2002; BBC Wildlife January 2002)

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References

Goulding, M.J. and Roper, T.J. (2002) *Press responses to free-living Wild Boar (Sus scrofa).* Mammal Review 32 (4) 272-282

McDonald, R (2002) *The perfect disciple – the perfect hunter. The myths and realities of Mustela.* British Wildlife 13 (6) 419-426.

Reece, S (2003) *Bristol Avon Otter Survey 2002.* Unpublished report.

Symes, R. and Yalden, D.W. (2002) *The former status of the Black Rat (Rattus rattus) in England and Wales.* Mammal Review 32 (4) 315-316.

Trump, D.P.C. (1999) *Bristol Mammal Report for 1997.* Nature in Avon. Proceedings of the Bristol Naturalists' Society 57 29-41.

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Amphibians in the Bristol Area

Mary Wood

Great Crested Newt *Triturus cristatus*

Great Britain is the European stronghold for this species, which has suffered such severe declines that it is now protected under the European Habitat Regulations (Conservation Regulations 1994 in English law) as well as the Wildlife and Countryside Act 1982. It is also the subject of a UK Biodiversity Action Plan.
There are several recorded sites in the Bristol region but many of these need confirming, as they are 1980s records.

Great Crested Newts have more specialised needs compared with other amphibians. They have evolved to live in metapopulations, which means one community depends on several clustered ponds in order to survive the vagaries of pond viability. In the 18th century there was an English average of 17-20 ponds per square kilometre. Now, due to maximised arable areas and piped animal drinking water, we are lucky to find one or two. Of those that remain many may be unsuitable due to shading or pollution. The popularity of garden ponds has buffered frogs and the other newts to some extent, but they are usually too small to act as substitute habitat for Great Crested Newts, and the larvae are particularly vulnerable to the omnipresent goldfish, being forced by parental cannibalism to swim in the open water to avoid the pond edges where the adults hunt. In addition to all these disadvantages, only 50% of Great Crested Newt eggs (larger and more yellow than those of other newts) ever actually hatch due to a genetic mutation!

A potentially important local site, and one of great challenge to conservationists, is around the now extinct village of Charlton, north of Bristol. Old maps reveal that there used to be many village ponds in this beef producing region, and rumour has it that there were many Great Crested Newts. Housing development across the area must have greatly reduced their numbers, and in the 1940s the new runway for the Brabazon aeroplane was constructed, squeezing out both the village and the newt population. During that period, under the auspices of Rolls Royce, the large overspill pond, known as the Blue Lagoon, was built. Now it is owned by BAe and lies hidden from view beside the A38. Large and shallow, with steep sides and much native scrub and grassland planting, it has the appearance of a wildlife-rich rural lake, but its purpose is to act as a holding area for runway spillages (aviation fuel, firefighting foam and oil) from the BAe site. Water is piped under the A38 into a stone-sided trench and then into small sheer-sided settling tanks, with overflow when necessary into the Blue Lagoon. The gradually filtered water then passes on into Stoke Brook.

In the mid-90s it was suggested that the Blue Lagoon contained "thousands" of Great Crested Newts. This was probably an enthusiastic overestimate, but it does seem possible that this lake is acting as a refuge for the residual Charlton area population.

Historic documents at Bristol Regional Environmental Records Centre (BRERC) revealed that in 1986 a young couple who worked for Rolls Royce spent many lunch hours rescuing and washing newts (and other animals) from the oil tanks. Their largest count was Sep/Oct with 201 Great Crested Newt juveniles (and over 800 Smooth Newts in Aug) in the tanks. These animals were often in a poor state of health. They also found 32 adults and 32 larvae in the lake, with Great Crested Newts outnumbering Smooth. They estimated the total Great Crested Newt population as over 300 minimum. Movement could be quite early in the season, with the first newts seen in the tanks on Feb 10th.

In 2000 Avon Reptile and Amphibian Group (ARAG) decided to investigate (under licence from English Nature), and found several Great Crested Newts, with at least 4 dead, in the tanks on the 2nd June. Bottle trapping (42) caught 4 males and 2 females (and 3 Smooth Newts) in the lake on the 3rd June. On July 19th 2001 there were 11 Great Crested Newt adults (and 81 Smooth) in the tanks. On July 19th 2002 a tank search revealed no newts present.

Courtship behaviour has actually been observed in this polluted, vegetation-free environment (Great Crested Newt males perform an extraordinary series of wiggles and tail-waving). It seems unlikely that they could successfully breed in the tanks (perhaps the 1986 juveniles had found their way in having developed elsewhere), because of the oil pollution. The mystery is to try and understand how the newts get into the tanks, and whether they can get out again due to gaps in the valve system. It is assumed they inadvertently enter through the valves or by falling in, rather than selecting the filthy tanks as suitable habitat.

ARAG is attempting to get BAe through their contractors to put up mesh fencing around the top of the tanks, which would not only prevent newts from entering but also Bank Voles and other animals (birds, fox, cat, water vole and dog have all been found in the past). It is very important that a search is carried out of other ponds in the area and an attempt made to assess, and protect, what remains of the local population.

Hopefully other Great Crested Newt populations in the Bristol region are surviving in much less traumatic conditions.

Smooth and Palmate Newts *Triturus vulgaris and Triturus helveticus*

Smooth Newts (which differ from the Great Crested by their smaller size and continuous crest along the back and tail of the males in the breeding season) seem to be the most common in this area, with records concentrated around Bristol and fewest in B&NES. They seem to have been fairly successful in adapting to garden ponds. Palmate Newt records are particularly concentrated around the Bristol area, with just a scattering of records elsewhere. They are smaller than Smooth Newts, and the males have black expanded rear feet and a thread extending from the end of the tail in the breeding season. Reputed to prefer more acidic sites, they do seem to have a broader distribution than this would suggest.

Common Toad *Bufo bufo*

Toads seem to be dependent on their natal ponds, and will continue to return to the same site. If roads have been built so that the traditional route is interrupted, this can lead to mass slaughter, recognised in the mid-80s by the Highways Authority as a traffic hazard, serious enough to warrant the production of official signs.

Though it is to be hoped that many local Toad populations have not been thus afflicted, urban Toad crossings in the Bristol region have declined dramatically from 20 to 10 in just a decade. There are two sites in North Somerset (Clevedon and Yatton), two in Bristol (Fishponds and Shirehampton) and six in B&NES (3 in Bath, Temple Cloud, Norton Malreward and Paulton). (None are recorded in South Gloucestershire). Of these sites, only Clevedon, Charlcombe Lane in Bath, Fishponds and Temple Cloud remain substantial with numbers around 400. The reasons for declines seem to be a loss of feeding and hibernation habitats due to urbanisation and intensification of farming plus the loss or pollution of remaining ponds. Even if Toads do successfully make it to the breeding site, if that pond is also favoured by a fishing club, Toad spawn is often removed in the spring with vegetation clear-outs. Roadkills must also contribute to declines. Toad records are concentrated around Bristol, with only a scattering elsewhere.

This year Avon Wildlife Trust (AWT), in partnership with B&NES and the local community, has successfully campaigned to have Charlcombe Lane closed for the season, to avoid the annual decimation that claims at least a third of the Toads. This Toad road triumph is only the second time it has happened in the country, people in Oxton, Nottinghamshire being the pioneers 2 years ago.

Frogs

Frogs don't seem to have the same loyalty to their birthsites, and will quickly colonise suitable new ponds. Consequently garden ponds have helped to slow down the national decline, although losses continue. There is a frequent concern voiced to AWT and BRERC about ponds having too much spawn. It seems there is no such thing; only one egg in two thousand develops to an adult and competition and predation will reduce numbers to a pond's carrying capacity. A couple of decades ago there was great enthusiasm for spawn swapping, but the current advice is to leave well alone. As well as interfering with Frog populations, moving it carries the risk of transferring disease. This has spread from the south east of England and is currently thought to have been introduced with goldfish from the US as the bacteria are also found in bullfrogs. The Frog Mortality Unit is keen to record any occurrence of disease and can be contacted on 01986 873733. In addition, there is the risk of transferring fragments of alien aquatic plants, especially parrot's feather (*Myriophyllum aquaticum*), floating pennywort (*Hydrocotyle ranunculoides*), water fern (*Azolla filiculoides*) and Australian swamp stonecrop (*Crassula helmsii*). These will grow rapidly and choke out native vegetation.

Again, records for this area seem to occur mostly in Bristol. There seem to be only 13 sites in B&NES! As so often happens, records probably reflect the distribution of recorders rather than the animals. Any records will always be welcomed by BRERC.

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Drawing by Paul Stevenson

Natterjack Toad *(Bufo calamita)*

Proceedings of the Bristol Naturalists' Society (2002) 62:87-90

Bristol Invertebrate Report, 2002

R. J. Barnett

Introduction

Invertebrate activity stirred in March 2002 with butterflies seen on the wing around Keynsham by Barbara Price, including **Brimstone, Comma** and **Peacock.** By the 6th and 7th April, **Orange-tip, Small Tortoiseshell, Green-veined White** and **Speckled Wood** were also on the wing in the district. **Holly Blue** was first noted by Faith and Tony Moulin on 8th April and **Grizzled Skipper** by Paul Fletcher on 21st of that month at Thurlbear and on the 24th **Wall Brown** at Crook Peak. The first **Large Red Damselflies** to be reported were on the 21st April, at Yatton (Faith and Tony Moulin) and on the Somerset Levels (Julian Thomas).

Other highlights, in a largely quiet year, were another record of the scarce immigrant **Lesser Emperor Dragonfly** observed by John Aldridge near Parkway Railway Station and reports from Jeff Holmes of the **Long-winged Conehead Cricket** at Compton Dando Reservoir and Stockwood Open Space. The latter is still increasing its range and expanding into our district.

Migrants were relatively few with a handful of **Clouded Yellows** and **Painted Ladies** in mid-summer and a **Humming-bird Hawkmoth** in Abbots Leigh on 14th September seen by Trevor Silcocks.

Publications relating to invertebrates in the district included a comprehensive list of the rare diptera found by David Gibbs in recent years and the occurrence of the flies *Xylophagus ater* and *Carcelia bombylans* locally (Keith Alexander and David Gibbs, respectively) in volume 9 of the Dipterist's Digest journal.

On the beetle front, the **Lily Beetle** seems to now be well established in and around Bristol, and is not proving popular with gardeners who grow lilies or fritillaries!

The Avon Butterfly Group activity was largely confined to work on the manuscript for the *Butterflies of the Bristol Region*, due to be published in 2003. Concerns were expressed over the lack of sightings of the **Duke of Burgundy, Marsh Fritillary** and (the introduced) **Glanville Fritillary** which have all probably become extinct in Avon over the last five years or so. The **Small Blue** was also a species of concern with no sightings at the previous stronghold of Dolebury Warren and the possibility that it may no longer occur there.

The Bristol & District Moth Group continued their regular field meetings including the National Moth Night on 15th June. John Martin and Martin Evans also regularly trapped on Tickenham Hill courtesy of Keith Giles, an excellent site. Perhaps the most interesting new record was the single **Double-line Moth** that appeared on 23rd June in John Martin's garden in Pilning, presumably a wandering individual.

Sad news during 2002 was the death at the age of 80 of Edwin Arthur Frederick Dean, known to one and all as 'Dixie'. Dixie had been an active member of the Entomology Section of the Society particularly in the 1980s. He developed a very strong and knowledgeable interest in moths and light trapping from the late 1970s, visiting sites around Weston-super-Mare and especially on the Somerset Levels, often accompanied by other local experts such as Ken Poole and Martin Evans. In the last decade, Dixie was a stalwart of the meetings arranged by both the Somerset and Bristol & District Moth Groups respectively and he continued to be an active recorder up to and including the 2001 season. In addition to recording moths, Dixie also was an excellent exponent of macro-photography, some of his work can be seen for example in the *Collins Checkbook British Butterflies & Moths* published in 1995. Dixie is greatly missed for his enthusiasm for moths and his characterful contribution to field meetings.

My thanks, particularly to John Martin, but also to those who submitted records which do not appear in this report, such as records from Paul Chadwick and John Burton, which help significantly to build up a picture of our invertebrate fauna. Thanks also to the Bristol Regional Environmental Records Centre (BRERC) and contributors to the Bristol Wildlife e-group for supplying other data.

Scientific nomenclature follows the names given in Bradley (2000), Brooks (1997), Duff (1993) and Potts (1964).

Species Of Note In 2002

INSECTA

ORTHOPTERA
Conocephalus discolor (Thunb.) **Long-winged Conehead** Compton Dando Reservoir ST 64 64 (vc6) and Stockwood Open Space ST6 6 (vc6) Jeff Holmes. Continued expansion of this species across southern England.

ODONATA
Anax parthenope Selys **Lesser Emperor** Parkway Railway Station ST62 79 (vc34) 15 July 2002 John Aldridge. See last years report for previous record of this rare migrant.

HEMIPTERA
Sehirus luctuosus (Muls. & Rey.) 85 Cornwall Road, Bishopston, Bristol ST585 757 (vc34) 10 May 2002 Ray Barnett. A species that needs to be hunted for at the base of plants, consequently few local records.

LEPIDOPTERA (butterflies)
Boloria selene (D. & S.) **Small Pearl-bordered Fritillary** Sandford Quarry ST42 59 30 May 2002 Kurt Vickery. A very rare species in Avon and of concern with regard to its future status.

LEPIDOPTERA (macro-moths)
Synanthedon andrenaeformis (Lasp.) **Orange-tailed Clearwing** Tickenham ST442 724 (vc6) 13 July 2002 J. and M. Evans. A local diurnal moth whose larvae feed internally on *Viburnum* stems.
Tetheella fluctuosa (Hb.) **Satin Lutestring** Tickenham ST442 724 (vc6) 13 July 2002 John Martin. A species which is not common nationally, appears to be present in a number of woods locally.
Rhodometra sacraria (L.) **Vestal** Severn Beach ST5 8 (vc34) 27 July 2002 Paul Bowerman. A regular migrant to our area.
Euphyia unangulata (Haw.) **Sharp-angled Carpet** Chew Valley Lake ST56 58 (vc6) 27 July 2002 Mike Bailey. Very few records in the Avon area.
Mythimna turca (L.) **Double-line** Pilning ST556 849 (vc34) 23 June 2002 John Martin. Apart from a dubious record from Bath in the 19th century, this is the only known record for Avon. Presumably a wanderer from colonies further south or west.
Mythimna obsoleta (Hb.) **Obscure Wainscot** Pilning ST556 849 (vc34) 19 June 2002 John Martin. Of very local occurrence in the district.
Lygephila pastinum (Treits.) **Blackneck** Wapley Bushes ST710 803 (vc34) 5 July 2002 Ray Barnett; Pilning ST556 849 (vc34) 11 July 2002 John Martin.
Schrankia taenialis (Hb.) **White-line Snout** Tickenham ST442 724 (vc6) 12 August 2002 John Martin. As with the **Satin Lutestring** this moth is not common nationally but occurs in a number of woodlands in our area.

LEPIDOPTERA (micro-moths)
Acrolepiopsis assectella (Zell.) **Leek Moth** Pilning ST556 849 (vc34) 14 August & 17 September 2002 John Martin. Reported last year from two other localities.

Ethmia dodecea (Haw.) Tickenham ST442 724 (vc6) 19 July 2002 John Martin. A very attractive and very local species.
Recurvaria leucatella (Cl.) Pilning ST556 849 19 July & 1 August 2002 John Martin. Apparently common in the 19th century but much less so since.
Olindia schumacherana (Fabr.) Wapley Bushes ST710 803 (vc34) 5 July 2002 Ray Barnett. Never common, but an occasional species in woodland.

COLEOPTERA (beetles)
Aromia moschata **Musk Beetle** Walton Moor ST43 72 (vc6) 24 August 2002 Lyndon Roberts. An individual found (and released from) mist nets confirms the continued existence of a population at this site.
Cetonia aurata **Rose Chafer** Dryleaze Road, Stapleton ST626 769 (vc34) 8 June 2002 Andrew Shand. The Rose Chafer is probably widespread in Bristol and this record adds another dot to the distribution map for the city.
Liliocerus lillii **Lily Beetle** Clifton ST56 73 2 June 2002 Richard Bland (first seen at this site in 2001); Bristol ST607 676 June 2002 Rich Andrews.

DIPTERA (flies)
Volucella zonaria Kingsdown Bristol ST5 7 22 August 2002 Des Bowring. This magnificent large hoverfly is, like the Rose Chafer beetle, found throughout the city of Bristol. Its larvae live inside wasp nests.

References

Bradley, J.D. (2000) *Checklist of lepidoptera recorded from the British Isles. (2nd edition, revised).* D.J & M.J.Bradley, Hants.

Brooks, S. (1997) *Field Guide to the Dragonflies and Damselflies of Great Britain and Ireland.* British Wildlife Publishing, Hants.

Duff, A. (1993) *Beetles of Somerset.* Somerset Archaeological & Natural History Society, Taunton.

Potts, W.H. (1964) *Kloet & Hincks, a checklist of British insects, part 1. Small Orders and Hemiptera* (2nd edition, revised). London, Royal Entomological Society.

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Proceedings of the Bristol Naturalists' Society (2002) 62:91-96

Report of Council 2002

1. The aims of the Bristol Naturalists' Society for 2002 were "*the promotion of education and research into Natural History, including geology, with special reference to the Bristol district; and the promotion and conservation of the British fauna and flora, and protection of geological and physiographical sites*".

2. The Society's activities consisted of sectional and general, indoor and field meetings. The Society's specialist Sections covered Botany, Geology, Invertebrates and Ornithology and there was an informal Mammal group. The preparation and distribution of the Society's publications, and the maintenance and development of its Library, consumed the greater part of the Society's income, and those activities were managed by committees that worked to plans and budgets agreed by Council (the Trustees).

Education

3. An extensive programme of interesting and stimulating meetings, both indoors and in the field, was offered to members during 2002, concentrating particularly, but not exclusively, on the Bristol district. There were 6 General talks, 7 General field meetings, 18 Sectional talks and 44 Sectional field meetings. Widespread advertising of these meetings by posters, and on the Web site, promoted their availability to visitors also. Attendances were good, reaching up to 60 at some meetings. New members were especially encouraged to attend, and to visit the library. A multi-media projector was purchased using monies from the Memorial Fund to allow computer and video images to be shown at meetings and to promote the Society's aims.

4. The Publications Committee was responsible for the production and distribution of the Society's 'monthly' Bulletin, and annual Proceedings (under the name of 'Nature in Avon'), and jointly with the Bristol Ornithologists' Club (as the Avon Ornithological Group) for the production of the Avon Bird Report. It was also responsible for the Society's website (www.bristolnats.org.uk). A special meeting of the Society in February warmly supported progress with the Society's publications, particularly changes made by the Editor in volume 60 of the Society's Proceedings. Council agreed with these views and confirmed its wish that the Proceedings continues as a refereed journal.

5. Nature in Avon volume 61 for 2001, a 128 page special issue on Ancient Woodland and Veteran trees in the Bristol Region, and their ecology, was published in October, and was well received by members and other organisations. This was the last volume edited by Dr.Terry Smith, and the

Council expressed its thanks for his inspiration and unstinting efforts. The volume was enhanced by additional coloured plates, funded from the Memorial Fund using part of a bequest from the estate of the late Mr. J.W. Redmond.

6. The 2001 issue of the Avon Bird Report was slightly shorter than in the previous two years because of the impact of foot and mouth disease on ornithological fieldwork. However, it included a history of the BTO Common Bird Census in the region since 1962, and a breeding season study of over half the area of Bristol.

7. Ten issues of the 'monthly' Bulletin, the Society's newsletter, were sent to members, and published on the web site. This important link with the membership continued to develop in character, resulting in a very positive response from members.

8. The Society's website, with the new domain name www.bristolnats.org, has a regularly updated news page, and held the current monthly bulletin. It was linked to other natural history sites in the region, and provided a key information service to members and others. By the end of 2002 there had been 2622 'hits'.

9. The Library Committee managed the Society's Library, which was housed in the Bristol City Museum. The Committee ensured regular and frequent opening of the Library (on 100 days) for the benefit of members, maintained the existing stocks, and acquired new publications. Subject to security needs, arrangements were made for access to the collections by non-members, such as Museum and University personnel. The Library was used by 51 members who borrowed 272 items. A special Library event was staged successfully in October, aimed particularly at new members, but also at encouraging established members to make a first visit. This was held in conjunction with the Bristol Magpies' art event, and fine illustrations from the Society's Library collection were displayed. A new computer was installed in the Library, donated by Mr S.M. Taylor. Good progress was made on producing a database of journals.

Research and Conservation

10. Records of observations made by members as part of both local and national recording schemes were submitted to Bristol Regional Environmental Records Centre, and formed the basis of the biota sections of Nature in Avon. Surveys included botanical, mammal, invertebrate and ornithological recording schemes. Members of the Society assisted with data entry at BRERC. Council donated to BRERC as complete a set as was possible of Society Proceedings.

11. The Society also had close local links with The City Museum, which housed its Library, with Bristol University (especially the Geology Dept.), with both Avon Wildlife Trust and Somerset Wildlife Trust, and with the Bristol City Council. Regionally it linked with the South West Naturalists' Union, and nationally it was involved with the British Trust for Ornithology, Botanical Society of the British Isles, the Woodland Trust, and Royal Entomological Society. Council donated to the R.E.S. two reports of the 1912 Congress of Entomology, thus completing that society's holdings of this important series.

12. Members were involved with the Bristol City Council Local Agenda 21 Action Plan Biodiversity Group, which supported a local winter garden bird-watch scheme organised by AWT, and which involved some 1600 local residents. A member of the Society analysed the results, which provided Bristol with a more detailed understanding of the density of species' use of gardens in winter than existed anywhere else. Information from this survey was used by the BTO in its report to the Department for Environment Food and Rural Affairs on the decline of the Starling and House Sparrow. Members took part in initiatives of the Frome Forum, hosted by the Forest of Avon, designed to raise public awareness of the wildlife value of the River Frome flowing into the centre of Bristol. The Mammal Group worked with the River Avon Catchment Otter Group to monitor the status of the Otter population.

13. Members of the Society assisted in the preparation of the '*Butterflies of the Bristol Region*', a companion volume to the '*Flora of the Bristol Region*', and a second grant was made to Bristol City Council from the Hector Hockey Fund, supported as necessary from the Milton Fund, towards its production. The Society was grateful to the AOG for funding new bird recording cards, of which some 10,000 a year are used, and met a request for a grant from the Conservation Fund towards their cost. Another grant was awarded from the Hockey/Milton Fund for attendance at a bryophyte identification training course.

14. The Geological Section was active in carrying out practical conservation work on key geological exposures in collaboration with Bath geologists. A grant from the Hockey/Milton Fund was agreed towards the re-erection of a geological interpretation board on the new ring road.

Promotion and Publicity

15. In an endeavour to attract a broader diversity of members, the Memorial Fund was used to support translation of the membership leaflet into 6 foreign languages. The new leaflet was distributed widely, particularly through Libraries, which continued to be the most successful recruitment avenue. The

cost of membership to students was kept at a lower level to encourage their involvement.

16. Posters announcing forthcoming meetings were produced frequently. In order to promote the objects of the Society, and to attract new members, stands were taken at the University of Bristol Freshers' event, at Bristol Water's Chew Valley Environment Day, and at Avon Wildlife Trust on Brandon Hill. New promotional material, including a banner and a large poster display, attracted attention at these events. One Council member attended a Media Radio Training Course, with a view to enhancing the ways in which the Society's objectives are promoted.

17. Publications produced by the Society were offered for sale at events. The revenue from these was small, and the main benefit of attending was to promote the aims of the Society.

18. A dinner, held to celebrate the 140th anniversary of the Society, was well supported and a great success. Raffle prizes were donated generously by @ Bristol, Bristol Zoo Gardens, London Camera Exchange, and Wildfowl and Wetlands Trust, Slimbridge.

19. The President represented the Society at a Millennium Award Ceremony at the Bristol Zoo. The Society was consulted over the bid from Bristol City Council to become European City of Culture 2008, and a report was written in support, emphasising the geological importance of the Avon Gorge, its extant species, the hundreds of years of their study and their intrinsic importance. Views were sought by the University of Bristol on the future of their Botanic Gardens, and a comprehensive response from the Society was welcomed.

20. Individual members who were involved in activities such as making and selling of bird boxes, and growing plants, gave donations, amounting to over £100, to the Society's funds from their sales. Other members generously gave donations, ranging from 50p to £86, particularly when paying their subscriptions.

Organisation and Membership

21. The Bristol Naturalists' Society is an unincorporated association, registered charity no.235494. The Society's activities are governed by the Rules, adopted in 1971, and amended in 1993 and 1999. All involved with the running of the charity were volunteers. There were no paid officials. The time provided

by volunteers was considerable, and was crucial in the success of the Society. It was necessary to employ the services of an accountant to help with the backlog of accounts. It proved very difficult to find a company prepared to handle charity accounts. The officers and members of Council were elected by members of the Society at an Annual General Meeting, held on 19th January 2002. The names of those proposed by the previous Council had been circulated to all members in the December 2001 issue of the Society's Bulletin and members proposed no further names. Those elected, together with the officers of Sections, served as the Trustees of the Society for 2002. Members were also elected to the Publications, Library, and Hector Hockey Fund Committees. Council and Library Committee meetings continued to be held at Clifton College.

22. At the end of 2002 membership of the Society was 640, an increase of 14 on the previous year. Amongst new members the Society was delighted to welcome the serving Lord Mayor of Bristol and his wife. The deaths were reported of Professor P.G. Drazin, Miss E.M.S. Langford, Mrs J. Morgan, Mrs P. Naish, Mrs M.I. Owen, Mr F.H. Rawlings, Mr J.A. Roberts, Mrs W. Wigmore and Miss B. Winter.

23. The Society's official address was Bristol Naturalists' Society, c/o The City Museum, Queen's Road, Clifton, Bristol BS8 1RL. The Society's main bankers were Lloyds TSB, 58 Queen's Road, Clifton, Bristol BS8 1RQ.

24. The Trustees' powers regarding investment etc. are prescribed in the Society's Rules, Council agreed to transfer from the Treasurer's Account monies representing the Memorial Conservation and Library Funds to a new Charities Aid Foundation account, which should pay higher interest without risk. These funds were used to support projects as decided by Council, The Hector Hockey and Milton Funds, and an Ornithological Section Special Fund, were held in Income Bonds and a National Savings Account. Grants from the Hockey Fund were governed by the Rules of that Fund. Council had agreed previously that the monies designated as the Milton Fund would be used to support "Hockey" applications also, and both funds were involved in 2002. Sections had individual bank and building society accounts holding sufficient funds to cover running costs.

25. Insurance cover presented difficulties during the year and exposed the Society temporarily to risks. Cover formally provided through British Trust for Conservation Volunteers was discontinued suddenly, and after considerable time and effort had gone into looking for alternative cover, BTCV came back with a new provider, albeit far more expensive.

Thanks

26. Grateful thanks are due to members who have volunteered their time in many ways, and have given generously to BNS funds, in helping the Society to meet its objectives. Special mention must be made of the sterling efforts of the team of publications distributors, who continued to save the Society substantial postal charges. The Society acknowledges with gratitude the facilities and support given by the Headmaster of Clifton College, and the Head of Museums, Bristol City Museum.

Plans for the Future

27. The Council of the Society for 2003 will be appointed on 18th January and those Trustees will be responsible for that year's strategic planning. A Rules sub-committee will need to continue its work and to report back to Council on any proposals for change. It is hoped that a higher level of publicity of the Society's objectives may be attained. On completion of the Library journals catalogue, work will start on cataloguing the books, separates, videos etc.

Appendix 1. Council 2002

Mr R. Barnett
Mr R.L. Bland
Mr S. Carpenter
Mr D.B. Davies
Mr D.B. Frost
Dr M.J. Hill
Ms M. Leivers
Miss S. McCarthy
Mr W. Morris
Mr A.G. Smith
Mr P. Stevenson
Mr R.G. Symes
Mr D.P.C. Trump
Mrs H. Wilmott
Mr N. Wray
Mr P. Belcher
Mrs W.J. Budd
Mr D. Cope
Dr W. Dixon
Miss S. Garden
Mrs A.F. Hollowell
Mr J. Martin
Mrs P. Millman
Dr H. Rose
Dr T.A. Smith
Mr D. Strawford
Mr S.M. Taylor
Mrs M. Trump
Mrs A. Wookey

Bristol Naturalists' Society Geological Section Field Secretary's Report 2002

The following excursions and activities were organised for the 2002 period

Saturday 23 March	The Miners Trail, Midsomer Norton & Radstock Joint event with Bath Geological Society Leader: Elizabeth Devon
Saturday 13 April	The Vale of Wardour Joint event with Bath Geological Society Leader: Isobel Geddes
Sunday 26 May	Geological site clearance project: Cherry Garden Railway Cutting, Willsbridge, South Gloucestershire Leader: Simon Carpenter
Monday 26 August	Rock & Fossil event Bristol & Bath Railway Path, Saltford Joint event with Bath Geological Society Leader: Elizabeth Devon & Simon Carpenter
Saturday 12 October	The Upper Triassic rocks of Manor Farm, Aust, South Gloucestershire Joint event with Bath Geological Society Leader: Simon Carpenter

The 2002 season of excursions and activities followed a similar pattern to previous years with a mix of field trips to sites of geological interest, geological site clearance projects and a promotional event.

The 'Rock and Fossil' event on the August Bank Holiday Monday was particularly successful with a large number of people (many hundreds) stopping on the Railway Path at Saltford to find out more about the local geology and the societies that promote it. Volunteers from the BNS, Bath Geological Society and the West of England Geologists Association are thanked for their time and support. The event received substantial press coverage in the local papers and Simon Carpenter was invited to talk about the event on BBC Radio Bristol.

Of the two site clearance projects, the Manor Farm, Aust day attracted the most volunteers and considerable effort was expended to clear part of the quarry face.

This kind of work is essential if we are going to keep our geological sites clear and accessible for future visits. All volunteers are thanked for their help and reminded that they are always welcome at future site clearance days.

The Bristol Naturalists' Society Geological Section combined with Bath Geological Society for a number of excursions – so thanks are due to their members and leaders as well as ours for making the 2002 season so successful.

Simon Carpenter Field Secretary

Geological Section Secretary's Report 2002

The following meetings were held throughout the year.

16th January Dr Eric Robinson Geology on the Doorstep

A variety of metamorphic, igneous and sedimentary rocks can be found in our immediate environment; grottoes and graveyards in the West Country and elsewhere can yield much, as explained by our distinguished speaker.

13th February Dr Simon Braddy
Eurypterids-Palaeobiology: Breathing life into Fossil Sea Scorpions

Scotland, Sweden, Vietnam and the Bristol region were home to marine scorpions the size of a small car during Palaeozoic times, so the audience discovered in this richly illustrated talk.

13th March Mr Chris Richards Mining in West Mendip

The ores of lead, zinc, cadmium, copper plus the ochres and ores of iron were mined in West Mendip from early times, so the audience learnt in this enjoyable presentation, embracing metallurgy, social history and industrial archaeology.

9th October Mr Paul Stevenson Trace Fossils from Aust Cliff

Trace fossils of ophiuroids, horseshoe crabs, crustaceans and 'worms' of Westbury Formation provenance can all be easily found on the beach at Aust.

13th November Dr Richard Twitchet
Recovery of Biodiversity after Mass Extinction
The benthic marine and ichnologic fossil records of basal Triassic rocks of Oman and the United States record a strong, swift rebound of diversity after the

mass extinction. Lilliput and Lazarus taxa plus frankincense were also on offer!

11th December Member's Evening

Short talks were presented by Howell Peregrine, Mike T. Curtis, Remmert Schouten and Paul Stevenson.

The Earth Sciences Department of Bristol University is thanked whole-heartedly for allowing the use of its lecture facilities again during the year.

Paul Stevenson Secretary.

Report of the Mammal Group for 2002

Several field trips were held this year concentrating on Water Voles and bats.

On May 14th Phil Quinn of the Avon Wildlife Trust led a Water Vole walk at Lawrence Weston. There were plenty of old Water Vole signs, old droppings, feeding platforms etc. but despite rumours that Mink had recently re-invaded the area, some of the group were lucky to catch a glimpse of the rear end of a Water Vole disappearing into the undergrowth next to the old incinerator site!

On July 10th there was a field trip (with the Avon Bat Group) to see the Natterer's Bat maternity roost at Elm Farm, Burnett. One bat emerged shortly before dark but as it was a particularly cold evening the expected 30+ bats decided to stay 'in doors'.

On July 18th there was a field trip to Abbot's Pool, Abbot's Leigh. It was a very warm evening with plenty of insects flying and the Pipistrelles, Noctules and Daubenton's Bats put on an excellent display. There was even a Lesser Horseshoe Bat hanging up in the cave at the end of the pool.

David Trump gave an illustrated lecture on the Wildlife of East Africa on October 17th at the Westmoreland Hall as part of the General Lecture series.

Bi-monthly Otter surveys continued with the North Somerset Otter Group. Otter signs were seen regularly in the Tickenham area. Regular contributions continue to be made to the Society's Bulletin and mammal records are collected from members and are deposited at the Bristol Regional Environmental Records Centre.

David Trump Secretary

Ornithology Section Report

At the AGM on 18th January 2002 no President was elected – the Committee had, yet again, been unable to find a candidate who was willing to stand. Richard Bland agreed to continue, as Acting President, whilst a new President was actively sought. Mary Hill was re-elected as Secretary/Treasurer. Joyce Callard, Alison Levinson and Mike Taylor (MT was previously co-opted, not elected) were elected to the committee, where they joined the re-elected members, Paul Farmer, Matthew Rogers and Brian Tizard.

Lecture meetings

The talks were interesting, informative, well illustrated and very well attended, particularly in the autumn session when the highest attendance in recent years, 76, was recorded. The average attendance was 47.33.

There were 6 indoor meetings in 2002

18th January	AGM + H.Rose	'A celebration of the wader'
1st February	John Tully	'Feral pigeons of Bristol, 10 years on'
15th March	P.Chadwick	'Birding in Namibia'
9th October	Barry Gray	'Watching Birds of Prey around Bristol – ever decreasing circles.'
6th November	Helen Williams	'Natural History of the Western Isles of Scotland.'
4th December	Prof.Pennycuick	'How far can a migrating bird fly, and how long does it take?'

There were 18 field meetings, average attendance 12.46

First winter session (3 walks)

Average attendance, first winter, 15.67

23rd January	Slimbridge	Trevor Evans and Dave Paynter
3rd March	Uphill	Don Cullen
24th March	Brean	Barry Gray

Summer 2002 (12 walks)

Average attendance, summer, 11.67

24th March	Brean	Barry Gray
10th April	Leigh Woods	Richard Bland
20th April	Sand Point	Paul Farmer
27th April	Forest of Dean	Tim Fretter

4th May	Puxton Moor	Brian Tizard
15th May	Frome Valley	Richard Bland
25th May	Blaise Woods	John Tully
6th June	Eastwood Farm	Barry Gray
22nd June	Wentwood	Sheila McCarthy
4th July	Marshfield	P.Chadwick & Paul Farmer
24th August	Slimbridge	Trevor Evans
31st August	GVRG ringing demo	Lyndon Roberts

Second winter session (3 walks)

Average attendance, second winter, 12.67

12th October	Frampton on Severn	Richard Bland
9th November	Severn Beach	Brian Lancastle
27th December	Chew	Paul Farmer

Field Work 2002

National Surveys.

BTO Heronry survey,
BTO Breeding Bird survey,
WWT,
WeBs survey, and Breeding Waders of Wet Meadows survey,
Nest record Card scheme,
National Peregrine survey,
The BTO Ringing scheme,
BTO Garden BirdWatch.

Local surveys.

Winter Bird Counts, Over wintering Warblers, Bristol Birdwatch, Winter garden survey, Peregrine watch.

Involvement with local authorities. Members have been involved with the work of the LA21 Biodiversity committee in Bristol and N.Somerset. Bristol Birdwatch is a scheme funded by Bristol City Council administered by Avon Wildlife Trust and analysed by a member of the BNS. Its records are used by the Quality of Life survey, and the work on Sparrow density in Bristol (based on Bristol Birdwatch) was quoted in the BTO report to DEFRA on Sparrow and Starling decline. The results of the BBS surveys are used by the Environmental Departments of the four local unitary authorities, and all records are sent to the Bristol Environmental Record Centre. Members have also been involved in the work of the Zoo Gorge and Downs Trust.

Ornithology Section AGM

The meeting was held at 7p.m. on Friday, 18th January 2002 in the Westmoreland Hall.

The Acting President, Mr.Richard Bland took the chair, 31 members were present.

1. The Acting President, Richard Bland, welcomed members to the meeting. Apologies were received from R.Symes, H.New and H.Rose (who would be late in arriving).

2. **Minutes** The minutes of the 77th AGM were read. The minutes were agreed by all who had been present (proposed P.Chadwick, seconded by S.M.Taylor) and were signed by the Acting President.

3. **Matters from minutes** The unwanted books from the library had been sold, through the BTO, for £100. The money went to library funds.

4. **Secretary's report** The secretary, Mary Hill, read her report concerning the year's activities. A copy is attached. Acceptance was proposed by D.Cullen, seconded by S.McCarthy and carried *nem con.*

5. **Treasurer's report** The treasurer, Mary Hill, presented a summary of the Current Account which had been audited by Trevor Silcocks. A copy is attached. Acceptance of the accounts was proposed by A.Donnell, seconded by P.Chadwick and carried *nem con.*

Mary Hill said that the money in the 'special fund' was still held by the Society Treasurer in the National Savings Account. She had not yet obtained an up to date valuation, but it would have increased only slightly because of the low rate of interest.

6. **Election of officers** The Acting President, Richard Bland, explained that once again there was no candidate for the presidency although he had made efforts to obtain one. This situation was very unsatisfactory. He said that he would, again, continue as acting president, but that he and the committee would urgently seek a replacement; he appealed to the meeting for help in this search.

Mary Hill was happy to continue as Secretary and Treasurer.

7. **Election of committee** The Acting President thanked all the members of the committee for their hard work during the past year. Don Cullen and Alan Kelly were retiring, having contributed a great deal over the last 4 years.

Present committee members happy to be re-elected were: Paul Farmer, Brian Tizard and Matthew Rogers. Mike Taylor, who was co-opted last year, was also happy to continue. The committee proposed two new members, Joyce Callard and Alison Levinson, who had agreed to serve. There could be room for four other members of the committee, but nobody else was nominated from the floor.

The committee's suggestion for membership in 2002 was proposed by A.Kelly, seconded by S.McCarthy and carried *nem.con.*

The Acting President said that the committee would welcome ideas for future lectures or walks.

8. **AOB**

The membership secretary, Ann Wookey, urged those who had not paid their subscriptions to do so, she mentioned that people should check that the sum on their standing orders was correct and urged all tax payers to sign gift aid forms.

As Society President, Ann Wookey thanked the committee and officers for their hard work – essential to keep the section running smoothly. Thanks were particularly due to Richard Bland for his long-standing role in the section, and for all the other work that he does for the society.

Forthcoming events The Acting Section President reminded the section of forthcoming field meetings and lectures.

There being no further business, the AGM was closed at 7.19 p.m. and was followed by a talk by Harvey Rose - 'In Celebration of the Wader'

Dr. Mary Hill,
Ornithological Section Secretary,
15, Montrose Avenue,
Bristol BS6 6EH.

General Field Meetings

30th March Miss Mary Morris Betty Daw's Wood, Nr. Newent

The day started with a guided tour of this SSSI, which is owned by Gloucestershire Wildlife Trust, and continued with walks into nearby woods. Betty Daw's was a mass of Daffodils, Wood Anemones, Primroses and Wood Violets. Many birds seen, including Lesser Spotted and Green Woodpeckers, Mistle Thrush and Buzzards.

27th April Miss Sheila McCarthy Mordiford, Nr.Hereford

A small group followed this loop of the Wye Valley Walk on a cool and sometimes damp day. We followed the wooded slopes of Backbury Hill, with meadows of cowslips in abandoned smallholdings on the lower slopes. The walk continued along quiet lanes then into woods along the Pentaloe Brook. Many birds seen, including a fine view of a Red-leggged Partridge.

18th May Miss Rachel Lee Wylye Valley

A wet day which did not deter the small enthusiastic group. The walk started along a broad track towards the chalk pit and a total of seven Roman snails were found in the ruts. Among birds seen or heard were Willow Warbler, Blackcap, Chiffchaff and Yellowhammer. Numerous plants included Cowslip, Woodruff, Lady's Smock and Bluebells.

8th June Miss Mary Morris Penallt, Monmouthshire

In the morning a visit to Pentwyn Farm owned by Gwent Wildlife Trust, where we had a guided tour. Meadows were a mass of wild flowers including Green Veined and Spotted Orchids. In the afternoon we followed the Ninewells circular walk – many wild flowers including Climbing Corydalis. Several butterflies and many birds, including at Pentwyn a Grasshopper Warbler heard.

13th July Miss Sheila McCarthy Wetland Centre, London

This was a return visit to see the full effect of specialised plantings in the different wetland habitats. There were a variety of reeds and grasses, massed Purple Loosestrife and Filipendula and an interesting turf roof covered in various sedums. Sedge and Reed Warblers seen and, among others, Emperor Dragonfly and Elephant Hawkmoth. Marsh frogs very visible.

7th September Don Cullen Pennington Marshes

A windy day and a total of over 45 species, which started with Kingfisher, Hobby, Snipe and a variety of Gulls as soon as we left the car park. Numbers of Redshank and Blacktailed Godwit were seen at lunchtime. Later we had good views of Yellow Wagtail and a Marsh Harrier was briefly seen.

19th October Miss Rachel Lee Savernake Forest

A sunny but cold day. We had two circular walks; in the morning we went via Savernake Lodge and in the afternoon we started along Sawpit Drive. Lovely old Sweet Chestnut and Oak trees. Fifty-five species of fungi identified including Black Bulgar, Cauliflower and Magpie fungi. Birds seen or heard included Nuthatch and Great Spotted Woodpecker.

Sheila McCarthy,
General Field Secretary,
16 Rysdale Road,
Westbury-on-Trym,
Bristol BS9 3QU.

Larva of **Privet Hawk Moth** *(Sphinx ligustri)*
Drawing by Paul Stevenson

Proceedings of the Bristol Naturalists' Society (2002) 62:106-112

"It was on a Cold Dark Winter's Night."

Mrs. Ann Wookey, President 2001 – 2002, gave her Presidential Address to the Annual General Meeting in January 2003. The following is a concise version of that address, which when given was illustrated fully using the Society's new multi-media projector.

During my two years as President I was fortunate enough to meet many representatives of other organisations, and a common reaction from them was astonishment that the Bristol Naturalists' Society had been active for 140 years! I began to think about the origins of the Society, the people involved, and about what life had been like in those days.

This took me back to 1862. That was the year when Abraham Lincoln had declared that all slaves would be freed from the following January, and the year that the American Civil War was raging at Shiloh, where more lives were lost than at the Battle of Waterloo. 1862 was just 8 years after the Charge of the Light Brigade, and 6 years after Dr. Livingstone discovered the Victoria Falls.

In January 1862, on a cold dark winter's night, Adolph Leipner, together with 6 other citizens of Bristol, arranged to meet to explore common interests. They formed themselves into a Provisional Committee to investigate potential support for the formation of a Society – *"to be devoted to the investigation of every branch of science that finds culture amongst us."*

These 7 inspired Gentlemen laid the foundations of the society we know today, 140 years later. Adolph Leipner was born in 1827 in Saxony, (now Germany). He came to this country at the age of 21, and became a naturalised Englishman. He and his wife had 4 children, all born in Clifton. He was a founder teacher at the newly formed Clifton College, before moving to University College, Bristol. He is particularly remembered for founding the first Botanic Garden of the University. For this purpose he was given a grant of £15 from the University, and together with other funding of about £90, he planted 509 plants, and purchased 247 packets of seeds (Delany and Winn 2002).

Henry E. Fripp occupied the Chair of Physiology in the Bristol Medical School – he was interested in the eye, and the optics of vision. He became the 2nd President of the Society, but sadly died in office in 1880.

John Beddoe was a practising physician in Clifton, and an ethnologist. He became the 4th President of the Society and was later made a Fellow of the Royal Society.

Stephen Barton was a businessman and an amateur entomologist. He became President of the Entomological Section, a position he held for 35 years!

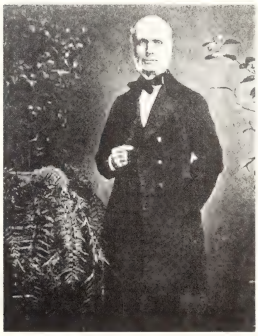
W.J. Fedden was interested in entomology and microscopy.

C.T. Hudson became widely known as an authority on the microscopical rotifera.

Finally, W.W. Stoddart was a public analyst, and an amateur geologist with wide scientific interests.

This Committee attracted 162 promises of support – and 11 established scientists agreed to become corresponding members. Adolph Leipner – as provisional Secretary, issued invitations in April 1862 to attend the inaugural meeting. On 8th May of that year, 79 gentlemen met at the Bristol Philosophical Institution, and agreed to form the Bristol Naturalists' Society. *(I was delighted to learn that my Grandmother's close friend had been housekeeper in Clifton to the son of one of these founder members, Joseph Wethered.*)

That initial meeting of the Society proposed rules, which included "*That this Society be called the Bristol Naturalists' Society*"; and that its object be "*the communication of new and interesting information on subjects connected with Natural Science.*"



The first President to be elected was William Sanders, a corn merchant, and he held this post for 13 years, until his death in 1875. He was a renowned geologist, and amongst other achievements was commissioned by Isambard Kingdom Brunel to place 2 large boulders of Pennant sandstone on plinths at the entrance to his railway tunnel at St Anne's, Bristol. These boulders had been dug out during the excavations of the tunnel, and although only one now remains *in situ*, the second is now sited in the University grounds in Woodlands Road, having been presented to the University of Bristol by British Rail Western Region in April 1983.

The first Vice Presidents were the Rev. Canon Guthrie and Dr. Day. W. Stoddart was elected as Treasurer, and Adolph Leipner as Secretary. The Centenary History booklet (Phillips, 1962) reflects "*to no other single member*

does the Society owe as much as to the first Secretary". Sadly, Adolph Leipner died in office in 1894 only a year after he had finally yielded to pressure to become President.

The Society met originally at the bottom of Park Street in the Philosophical Institution, on the site of the present Freemasons' Hall, where our very successful 140th Anniversary Dinner took place on 8th May 2002. The first indoor meeting was held there on Thursday 5th June 1862. William Sanders gave an account of the *Geology of Portishead*; there was a paper on *The Structure of Cartilage*, and another on *The Natural History of the Burrowing Slug*. During the rest of that first year papers were read on such diverse topics as characteristics of natives of this district, starfish, fossil plant beds, the cotton plant and predicting tides. These meetings were reported at length in the newspapers, such as the Bristol Daily Post.

It is interesting to note that in 1884 the Society then met in the City Museum, in the building to the left of the current Museum we know today. Archived correspondence shows a sharp exchange of letters over 'experiments' being carried out at meetings. A letter from City Museum states: - "*Gentlemen, We wish to state that we decline for the future to permit any Physical or Chemical experiment to take place in the inner Library room, unless a detailed notice of the proposed experiments be formally communicated to us for approval*"

The Society's response was to express regret "*that any unpleasantness should again have arisen, that is not of my seeking. I did not give notice of the Experiments, because I did not consider that the exhibition of a Dynamo – Electric Machine and the demonstration of the deflection of the needle of a Galvanometer came within the spirit of the Rules*"

The first field excursion, held on 8th July 1862, was to Bath and Claverton. Interestingly, at our Centenary celebration, in 1962, that excursion was re-created, covering much of the same ground. Two more excursions occurred in 1862, one to Dursley, and the other, to which ladies were invited for the first time, was to Portishead from Bristol on the steamer the *Fairy Queen*.

Two years later, that same steamer disgraced herself in the eyes of the Society, when having already walked from Bristol to Shirehampton, the tired members awaited the return trip by boat. The excitement of seeing the *Fairy Queen* coming up the river was rapidly dampened as it blithely sailed past and away, leaving them no alternative but to walk back all the way to Bristol. The only available horse carriage was given to the most *fatigued* of the ladies!

There is a nice report that at a field meeting in August 1865 about 40 members and their friends *availed themselves* of the opportunity of visiting Cheddar. On that occasion they were conveyed in two large breaks, furnished by Mr. Wakeham, of Kings Square, "*and the manner in which his horses performed their work gave great satisfaction.*"

Ladies appeared as visitors at indoor meetings in 1863 *"whenever the subjects are likely to be of a nature to interest a female audience"*. Five years later it was agreed to admit ladies as Associate members. Soon afterwards, the first paper by a lady member (who in this instance remained anonymous), was read for her by the Secretary, and intriguingly was entitled '*Notes on a Novel Application of Tea leaves*!'.

By 1865 five sections had been formed – these were Botanical, Chemical and Photographic, Entomological, Geological, and Zoological. Subscriptions to the Society were originally 5s.0d. (25 pence in current money), and a further 2s.6d. (12.5 pence in current money) was paid for each Section attended. These individual Sectional membership fees were not abolished until 80 years later, in 1946. It should be noted that, even as long ago as 1867, the Treasurer had already reported difficulties in collecting subscriptions. Despite using a professional collector he needed to make almost 1600 visits in a year to collect what amounted to no more than 300 subscriptions.

As already mentioned, the early meetings of the Society were reported extensively in the local newspapers, but in 1873 it was resolved that after the close of the current year '*the Proceedings of the Society be published annually*' – and that has continued to the present day.

Our publications have developed throughout our history. The Logo used on the earliest Proceedings was designed by two members of the Society in the early 1870's, and is still in use today. It is beautifully replicated on the Presidential badge, about which very little seems to be known, apart from it being made from silver gilt, the emblem is hand painted and then enamelled. The badge was presented to the Society by Mr G. McMurtrie, who was President in 1935.

When the Society was founded in 1862, Queen Victoria was still on throne, Prince Albert having died in the previous year. Bristol was still 2 years away from seeing the completion of Brunel's Suspension Bridge, and 10 years away from the topping out of the spire of St Mary Redcliffe. In 1862 Adolf Leipner had become one of the founder masters of the newly opened Clifton College. Water supplies, which clearly were most important in influencing the health of the city, were still very limited. Taylor (1986) described progress made with supplies, and reported that in the great drought of 1864 the Mendip Springs

almost dried up. As water supplies improved then of course the need to dispose effectively of waste increased also and a further paper (Gray 1986), in the same issue of our Proceedings, said that between 1855 and 1875 over 40 miles of sewer systems were constructed.

At that time Mathews' Bristol Directory showed that pillar boxes were already being cleared 4 times a day, and 10 trains a day were leaving Bristol for London. A warm first class bath was available for 6d., a cold first class bath for 3d.! There were 9 Bristol newspapers in print, including the Western Daily Press.

Natural History Societies (or Field Clubs) emerged in the 1800's from Literary and Philosophical Societies. The very first, which is still going strong, seems to have been the Ashmolean, founded as long ago as 1828. Others included those quaintly named after the inns where they met, such as the Independent Oddfellows Arms Botanical Society, and the Black Cow Botanical Society. In this area the Cotteswold Field Club and Bath Society were possibly the earliest.

By the 1860's the concept of a field club had changed from the original, and another distinctive type of society emerged, peculiar to large towns and cities. In Liverpool, Manchester and Bristol, almost simultaneously, societies were founded which differed at once in the enormous size of their membership and the correspondingly lavish scale on which they were conducted. The Manchester Field-Naturalists Club recorded an attendance of no fewer than 550 on one of its outings!

Charles Darwin had in 1859 published his *Origin of Species*, and along with Wallace's views this had caused enormous consternation throughout the world. In 1860 a witty bit of repartee at a meeting, at Oxford, of the British Association for the Advancement of Science was '*destined to be blown out of all proportions to become the best known 'victory' of the 19th century, save Waterloo*.' This was of course the 'battle' between Bishop Wilberforce and Thomas Huxley. When Wilberforce asked Huxley "*whether it was through his grandfather or his grandmother that he claimed descent from a monkey*" Huxley replied along the lines that "*if he had to choose between a poor ape for an ancestor and a man of great influence, who ridiculed scientific discussion, he would affirm his preference for the ape*!"

Our *Proceedings* have changed over many years, and of course we now expect colour illustrations, and we use digital cameras. The early *Proceedings* had illustrations which were produced on blocks – many of which we still have in the Library. In books published at that time woodcuts and engravings were used. In his '*Insects at Home*' (1872) the Rev Wood invites readers to colour in the

illustrations by hand. For the full-page engravings he recommended first of all a liberal use of ox gall in mixing the colours so as to neutralise the oily lines of the printer's ink. It really is quite difficult to imagine the complexity of producing illustrations in the 19th Century.

The approach to collecting, recording, and conservation was somewhat different in those days too, as typified by a report of a meeting in February 1865. '*Mr. H. Ferris exhibited a specimen of a green woodpecker, shot near Yatton, which he stated was one of many birds which were rapidly becoming rare from no assignable cause*!'

So having explored the origins and early establishment of the BNS – where does the most recent President fit in amongst all these illustrious predecessors?

William Sanders, our first President, will be remembered as a world famous geologist. He was a founder of the Microscopical Society – he had established a national reputation for his geological work. He began mapping the Bristol district in 1835, specialising in large scale maps (4in. to 1 mile), which he completed in 1862, and in recognition he was elected a Fellow of the Royal Society. In 1874 our minutes record that *"Mr. Pass proposed and Mr. Leipner seconded the purchase of Mr. Wm. Sanders' large Geological Maps of the Bristol Coalfields, mounted on canvas and folded"*. These original maps are held in the Society's archives.

As President, Sanders was a daunting role model – but that status should not be seen as essential to lead the Society. I offer myself in total comparison, as the most recent President, and only the fifth lady to occupy this post in our history. I recall that my 'introduction' to natural history was at the age of 16, when an unfortunate earthworm became the subject of a dissection class, and then remained pinned to a piece of cork on my bedroom notice board for many years, offering homes to

multitudes of micro-organisms! My interest in natural history is very broad, as an amateur, and really my claims to fame are as a former England trampoline International, and as a company director!

I am trying to show, that it is not essential to be an exceptional naturalist, or scientist, to hold any office within this Society. The Bristol Naturalists' Society is run by teams of enthusiastic and willing volunteers, who are involved in Council, Section and other Committees.

This is a Society in which everyone can make a contribution. Individual interests may be in recording birds, mammals, invertebrates, or plants, - and sending in records for the biota reports in the Proceedings is a target. The Publications Committee always welcomes comments, advice and ideas on the content and quality of our publications, and the Library Committee is constantly looking to improve our library facilities. Help is always welcomed in the Society, ranging from quite simple, but important ways, such as offering to make the tea at the next meeting, to proposing talks or locations for field trips.

The sun has set on my Presidency, and I will always have happy memories of two thoroughly enjoyable years. But the dawn of Simon Carpenter's Presidency is just breaking and I would like to assure him of my full support, and wish him every success in his new role.

References

Gray, B.M.J. (1986). *Bristol's Sewage and the Birdlife of the Tidal River Avon.* Proc. Bristol Nat. Soc. 46, pp 19 – 24.

Phillips, F. Coles (1962). *A Centenary History of the Bristol Naturalists' Society 1862 – 1962.* Proc. Bristol Nat. Soc. 30, (3A), pp181 – 214.

Taylor, S.M. (1986). *Bristol's Water Supply – History and Environmental Aspects.* Proc. Bristol Nat. Soc. 46, pp 11 – 18.

Delany, R. and Winn, G. (2002). *How Did this Garden Grow? The History of the Botanic Gardens of the University of Bristol.* Pub. The Friends of Bristol University Botanic Garden.

Bristol Naturalists' Society
Library Report For 2002

An 'Open Day', attended by 10 new and existing members (and 4 'Magpies'), introduced them to the contents of the Library, to archive material, and a supporting display in the Entrance Hall of the Museum attracted public attention. Regular reports in the Bulletin of new accessions and topical items proved of interest to members. Library maintenance activities included some notable progress with sorting and removing surplus materials. All journals held were entered onto a computer database; it now remains to make that more user-friendly. Progress was made towards binding long runs of back numbers of our Proceedings.

51 (59 in 2001) members made 341 (374) visits to the Library and borrowed 272 (272) items. 11 (8) of these visits were made by new members. 34 journals were received by subscription, 34 by exchange and 13 journal runs were received as gifts. 9 books were purchased, and 11 books, 43 issues of journals, and 8 pamphlets/offprints and reports, and 1 videotape, which had been donated, were accepted into the library stock.

Special nameplates were added to items given by members and others. For donations we were indebted to Bath Natural History Society, Biodiversity U.K., The Barn Owl Trust, Dr. R. Bradshaw, Ms. R. Delany, Department for Food and Rural Affairs, Ms. G.M. Dyche, Mrs A.F. Hollowell, Mr. M. Rogers, Mr. R. Rowe, Mr. B. Tizard, Mr. D. Warden, Mr. D.A. Wilson, and Mr. M.A.B. Wordsworth.

Mrs A.F. Hollowell was re-elected as Honorary Librarian. The Library Committee met on 4 occasions. Members were Mr. R.G. Symes (Chairman), Mr. R.L. Bland, Ms. S. Hawkins, Mr. P.J.M. Nethercott, Mr. B. Tizard, Mr. D.P.C. Trump, Mr. D.A. Wilson, Mrs. A.M. Wookey, and a welcome new member, Mr. M.A.B. Wordsworth. The Society's Archivist attended meetings *ex officio*. Members continued to staff the Library from 12.30pm to 1.30pm on Wednesdays, and from 10.15am to 12.00pm on Saturdays. The Committee completed the year's work within the budget agreed by Council.

In accordance with the charitable status of the Society, but subject to appropriate security considerations, access to the Library was made available to others, particularly by arrangement with the University of Bristol. 8 visits were made by members on the staff of the City Museum, 1 by non-member Museum staff.

All members of the Committee are thanked for their contributions during 2002. The Society also thanks Mr Stephen Price, Head of Museum Services, Bristol

City Council, for use of the Library room, and for the assistance given to members during the year by Museum staff, and welcomes the continued use made by the Library by Museum staff

Roger G. Symes
Chairman, BNS Library Committee.

Redpoll *(Acanthus flammea)*
Drawing by Paul Stevenson

BRISTOL NATURALISTS' SOCIETY ANNUAL ACCOUNTS

STATEMENT FROM THE HON. TREASURER

Members will be aware that there have been unfortunate delays in publication of the annual accounts of the Society.

I apologise for the extent to which that has been my own responsibility. The Trustees (Council) have been kept informed of the progress made and difficulties faced. The Trustees agreed that professional accountants and auditors should be employed to speed up processing of delayed financial statements and the first of those reports is presented here.

The report is a slightly shortened version of that which has been agreed by the Trustees and sent to the Charity Commission.

Copies of the full report are available for consultation by any member of the Society.

It must be reported that a member of the Society has raised an objection to the treatment in these accounts of the Hector Hockey Fund as an endowment fund, which so imposes limitations on Council's use of that fund. Clarification of the status of this Fund is being sought.

Roger G. Symes

REPORT AND FINANCIAL STATEMENTS FOR THE YEAR ENDED 31 DECEMBER 1998

TRUSTEES REPORT FOR THE YEAR ENDED 31 DECEMBER 1998

The Trustees present their report along with the financial statements of the charity for the year ended 31 December 1998. The financial statements have been prepared in accordance with the accounting policies and comply with the charity's trust deed and applicable law.

The Trustees consider that the performance of the charity has been most satisfactory.

There was a noticeable increase in voluntary income this year from £5,533 (1997) to £8,887. This increase is attributed to income received from various Bequests. Investment income has also nearly doubled from £1,073 in 1997 to £2,034 in the current year.
The Trustees are pleased to report a surplus for the year of £6,243 (1997 deficit of £1,730).

Statement of Trustees' responsibilities

The Trustees are responsible for keeping proper accounting record which disclose with reasonable accuracy at any time the financial position of the charity and enable them to ensure that the financial statements comply with the Charities Act 1993. They are also responsible for safeguarding the assets of the charity and hence for taking reasonable steps for the prevention and detection of fraud and other irregularities.

Approval
This report was approved by the Trustees on 3 December 2002 and signed on their behalf.

R Symes Trustee

REPORT OF THE INDEPENDENT AUDITOR TO THE TRUSTEES OF BRISTOL NATURALISTS' SOCIETY

We have audited the financial statements, which have been prepared under historical cost convention and the accounting policies.

The charity's Trustees are responsible for the preparation of financial statements in accordance with applicable law and United Kingdom Accounting Standards. Our responsibility is to audit the financial statements in accordance with relevant legal and regulatory requirements and United Kingdom Accounting Standards.

We have been appointed as auditors under section 43 of the Charities Act 1993 and report in accordance with Regulations made under Section44 of that Act.

We report to you our opinion as to whether the financial statements give a true and fair view and are properly prepared in accordance with the Charities Act 1993. We also report to you if, in our opinion, the Report of the Trustees is not consistent with the financial statements, if the charity has not kept proper accounting records, if we have not received all the information and explanations we require for our audit, or if information specified by law regarding trustees' remuneration and transactions with the charity is not disclosed.

We read the Report of the Trustees and consider the implications for our report if we become aware of any apparent misstatements within it.

Basis of opinion

We conducted our audit in accordance with Auditing Standards issued by the Auditing Practices Board. An audit includes examination, on a test basis, of evidence relevant to the amounts disclosures in the financial statements. It also includes an assessment of significant estimates and judgements made by the trustees in the preparation of the financial statements, and of whether the accounting policies are appropriate to the charity's circumstances, consistently applied and adequately disclosed.

We planned and performed our audit so as to obtain all the information and explanations which we considered necessary in order to provide us with sufficient evidence to give reasonable assurance that the financial statements are free from material misstatement, whether caused by fraud or other irregularity or error. In forming our opinion we also evaluated the overall adequacy of the presentation of information in the financial statements.

Opinion

In our opinion, the financial statements give a true and fair view of the state of the charity's affairs as at 31 December 1998 and of its incoming resources and application of resources, including its income and expenditure, in the year then ended and have been properly prepared in accordance with the provisions of the Charities Act 1993.

Harwood, Lane & Co Chartered Accountants and Registered Auditors
Hayward House, 140 Hayward Road, Redfield, Bristol. BS5 9QA

3 December 2002

STATEMENT OF FINANCIAL ACTIVITIES FOR THE YEAR ENDED 31 DECEMBER 1998

	Notes	Restricted Funds	General Funds	1998 Total	1997 Total
Incoming Resources					
Voluntary Sources	2	3,188	5,699	8,887	5,533
Trading Activities	3	0	2,468	2,468	51
Investment Income	4	1,593	441	2,034	1,073
Sections Income		0	2,847	2,847	0
Miscellaneous	5	0	185	185	220
Total Income		4,781	11,640	16,421	6,877
Resources Expended					
Direct Charitable Expenditure	6	1,210	4,468	5,678	7,527
Fundraising Costs		0	0	0	0
Management and Administration	7	0	4,500	4,500	1,080
Total Resources Expended	8	1,210	8,968	10,178	8,607
Net Incoming/(Outgoing) Resources for the year	14	3,571	2,672	6,243	-1,730
Transfer between Funds		844	-844	0	0
Balances brought forward at 1 January 1998	14	29,917	8,448	38,365	10,178
Balances carried forward	14	£34,332	£10,276	£44,608	£8,448

Statement of Recognised Gains and Losses

There were no recognised gains or losses other than those disclosed in the two reported financial years.

BALANCE SHEET AS AT 31 DECEMBER 1998

	Notes	1998		1997	
CURRENT ASSETS					
Debtors	9	151		96	
Investment Accounts	10	11,652		12,742	
Cash at bank and in hand		34,102		25,878	
		45,905		38,716	
CREDITORS; amounts falling Due within one year	11	1,297		351	
Net current liabilities			44,608		38,365
Total Assets less Total Liabilities			£44,608		£38,365
Capital					
Restricted Funds	12/14		34,332		29,917
General Funds	14		10,276		8,448
			£44,608		£38,365

Approved by the Trustees on 3 December 2002 and signed on their behalf.

Name: A. Wookey (President) Trustee

NOTES TO THE ACCOUNTS FOR THE YEAR ENDED 31 DECEMBER 1998

1 ACCOUNTING POLICIES

1.1 Basis of preparation of accounts

The accounts are prepared under the historical cost convention. The accounts have been prepared in compliance with Statement of Recommended practice on Charity Accounts.

In preparing the financial statements the charity follows best practice as laid down in the Statement of Recommended Practice "Accounting and Reporting by Charities" (SORP 2000) issued in October 2000.

1.3 Income

Voluntary income and donations are accounted for as received by the charity. The charity also receives income from member subscriptions, which are accounted for in the relevant period of membership. Income from trading activities is accounted for as received by the charity.

1.4	Expenditure on management and administration of the charity		
	Administration expenditure includes all expenditure not directly related to the charitable activity or fundraising ventures. This includes the related costs of the day-to-day running of the charity such as printing, postage and stationery, and it also includes the auditor's fees.		
2	Voluntary Sources	1998	1997
	Subscriptions	5,146	5,225
	Bequests	3,141	
	Donations	600	308
		£8,887	£5,533
3	Trading Activities	1998	1997
	Library Sales	126	51
	Proceedings Sales	2,220	0
	Plant sales	122	0
		£2,468	£51
4	Investment Income	1998	1997
	Interest on Deposit Accounts	£2,034	£1,073
5	Miscellaneous Receipts	1998	1997
	Field Committee Surplus	100	0
	Social Evening Income	0	175
	Miscellaneous Income	85	45
		£185	£220
6	Direct charitable expenditure	1998	1997
	Meetings	539	948
	Library	472	581
	Proceedings and Avon Bird Report	1,150	3,793
	Bulletin Printing (and Distribution in 1998)	1,282	1,053
	Publications Distribution	664	1,080
	Donations and Grants to other Organisations	320	54
	Sections Expenditure	1,210	0
	Subscriptions to other Organisations	15	18
	Publicity	26	0
		£5,678	£7,527
7	Management and administration	1998	1997
	General Printing and Stationery	111	528
	General Postage and Telephone	173	89
	Bank Charges	27	34
	Subscription Refund	37	73
	Miscellaneous (Inc Social Evening)	275	331
	Second Hand Computers	600	0
	Public Liability Insurance	0	25
	Audit Fee	470	0
	Sections Expenditure	2,847	0
	Outstanding Cheques 1997 not cleared	-40	0
		£4,500	£1,080
8	Surplus Resources Expended	1998	1997
	The surplus of income over expenditure is stated		
	After charging:		
	- Audit fees (inclusive of VAT)	470	0
9	Debtors	1998	1997
	Prepayments	151	96
		£151	£96
10	Investments	1998	1997
	National Savings Income Bonds	10,000	10,000
	National Savings Investment Account	1,652	2,742
		£11,652	£12,742
11	CREDITORS: amounts falling due within one year	1998	1997

Subscriptions in Advance	827	71	
Proceedings	0	280	
Accruals	470	0	
	£1,297	£351	

12 Funds of the Charity

General Fund

The general fund of the charity is the charity's operational fund used for its day-to-day activities.

Memorial Fund

This fund combines the former Williams Fund money with a legacy from Mrs. Milton, and with the small amounts in the Harry Savory Illustrations Fund, and substantial bequests from others. The Memorial Fund receives legacies, and donations from friends in memory of past members. Grants are paid at the discretion of the Council, there being no specific aim for this fund.

Conservation Fund

This is the name accepted as that of the former Conservation Appeal. It receives ad hoc donations and the Council makes occasional awards from this fund.

Library Fund

This was initially the balance from a previous sale of surplus books from the Library which realised £3,300 - included in the 1995 accounts. Payments from the fund are at the authorisation of the Council.

Hector Hockey Fund

This is treated as an endowment fund which supports projects and has a set of rules under which the HHF Trustees work and recommended to Council any grants to be made. It is represented by the National Savings Income Bonds and is part of the National Savings Ordinary Account.

Milton Fund

Because the Hockey Fund attracted only small amounts of income as interest, and so only relatively small grants could be made, Council decided that £5,000 of the bequest from Mrs. Milton would also be put into Income Bonds and that income used to back up the Hockey Fund, working to the same rules as that fund. The Milton Fund is not an endowment fund.

Ornithology Section Fund

Monies in the Ornithology Section Special Fund are reserved by the Section as seed-corn funding should publication of an avifauna of the county become feasible.

13 Analysis of net assets between funds

	General Fund	Permanent Endowment	Special Funds	Total
Current Assets	11,573	5,839	28,493	45,905
Current Liabilities	-1,297	0	0	-1,297
	£10,276	£5,839	£28,493	£44,608

14 Statement of funds

	At 01.01.1998	Income & Transfers	Expenditure	At 31.12.1998	December 1997
General Fund	8,448	10,796	-8,968	10,276	8,448
Permanent Endowment					
- The Hector Hockey Fund	6,661	388	-1,210	5,839	6,661
Special Funds					
- Memorial Fund	14,889	3,796	0	18,685	14,889
- Conservation Fund	75	62	0	137	75
- The Library Fund	2,886	113	0	2,999	2,886
- Ornithology Section Fund	0	879	0	879	0
- Milton Fund	5,406	387	0	5,793	5,406
Total Restricted Funds	23,256	5,237	0	28,493	23,256
Total Funds	£38,365	£16,421	(£10,178)	£44,608	£38,365

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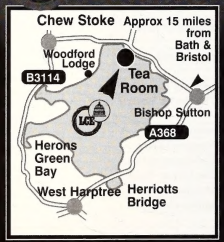

INSTRUCTIONS FOR AUTHORS

The editor welcomes original papers on the natural history of Avon and surrounding areas for consideration for publication in the Proceedings. Inexperienced authors may obtain advice from members of the Publications Committee. Authors should remember that their readers may not be specialists in the particular subject, and that unnecessarily technical language can be a barrier to understanding.

All papers for consideration should reach the editor by the end of November for publication in the following year. If there is likely to be a problem with this, the author should contact the editor in advance. All Society Reports and Biota should reach the editor by the end of January in the year of publication.

Whenever possible, text should be submitted on a disk as a file produced using a recent word-processor program (preferably Word 2000). Please specify the software and version used. The disk and a final hard copy version of the manuscript, if submitted, should match exactly. The wording should follow the style and format of the Proceedings, i.e. Titles in 10pt Arial Bold and body text in 10pt Times New Roman on an A5 page. An abstract should be supplied, and the text should be organised with appropriate headings and sub-headings. Submitted manuscripts should be double-spaced with wide margins and printed on one side of the paper only. Authors should retain a copy. Captions to illustrations should be given separately at the end of the text. Abbreviations should be defined on first use, but these should be avoided in the abstract.

Originals, not copies, of photographs, slides, line drawings, diagrams and maps should be submitted, returnable on request. Drawings and other diagrams should not be more than twice final size and made in monochrome. Photographs may be submitted as prints in colour or monochrome. These will normally be reproduced in monochrome, though consideration will be given to their publication in colour. Graphs, charts and simple diagrams should be produced by computer graphics: advice and help with this are available. Permission to reproduce copyright material is the responsibility of the author.

References should be listed at the end of the text, in alphabetical order of the first author's name, and should take the following form. (with book and journal title in italics and first line hanging).

Book: Author (Date). *Title*. Place of publication: Publisher. - e.g.

Rackham, O. (1986). *The history of the countryside*. London: J.M. Dent.
Clapham, A.R., Tutin, T.G. and Warburg, E.F. (1952) *Flora of the British Isles*. Cambridge at the University Press.

Paper: Author (Date). Title. *Journal Name*, volume (part), page nos. - e.g.

Ross, S.M. and Heathwaite, A. L. (1986). West Sedgemoor: its peat stratigraphy and peat chemistry. *Proceedings of the Bristol Naturalists' Society*, **44**, 19-25.

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Photograph: Charlie Hamilton-James.